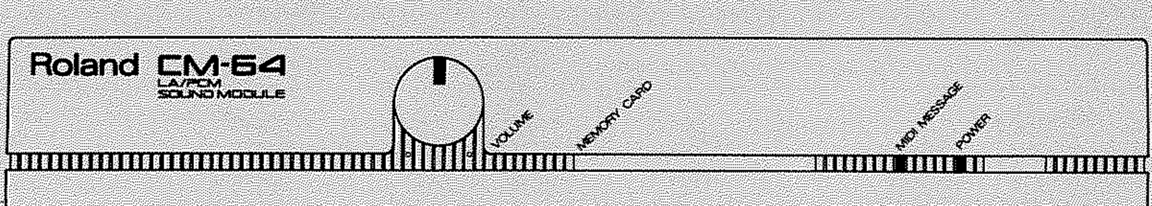
Roland

LA/PCM SOUND MODULE

CM-64

OWNER'S MANUAL



For the U.K.

IMPORTANT: THE WIRES IN THIS MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE.

BLUE : NEUTRAL
BROWN : LIVE

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured RED.

For West Germany

Bescheinigung des Herstellers/Importeurs

Hiermit wird bescheinigt, daß der/die/das

LA/PCM SOUND MODULE CM-64

(Gerät, Typ, Bezeichnung)

in Übereinstimmung mit den Bestimmungen der

Amtsbl. Vfg 1046/1984

(Amtsblattverfügung)

funk-entstört ist.

Der Deutschen Bundespost wurde das Inverkehrbringen dieses Gerätes angezeigt und die Berechtigung zur Überprüfung der Serie auf Einhaltung der Bestimmungen eingeräumt.

Roland Corporation Osaka/Japan

Name des Herstellers/Importeurs

For the USA

RADIO AND TELEVISION INTERFERENCE

WARNING — This equipment has been verified to comply with the limits for a Class B computing device, pursuant to Subpart J, of Part 15, of FCC rules. Operation with non-certified or non-verified equipment is likely to result in interference to radio and TV reception.

The equipment described in this manual generates and uses radio frequency energy. If it is not installed and used properly, that is, in strict accordance with our instructions, it may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J, of Part 15, of FCC Rules. These rules are designed to provide reasonable protection against such a interference in a rasidential installation. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment on and off, the user is encouraged to try to correct the interference by the following measure:

- Disconnect other devices and their input/output cables one at a time. If the interference stops, it is caused by either the other device or its I/O cable.
  These devices usually require Roland designated shielded I/O cables. For Roland devices, you can obtain the proper shielded cable from your dealer. For non Roland devices, contact the manufacturer or dealer for assistance.
  If your equipment does cause interference to radio or television reception, you can try to correct the interference by using one or more of the following measures.
- Turn the TV or radio antenna until the interference stops.
- Move the equipment to one side or the other of the TV or radio.
- Move the equipment farther away from the TV or radio.
- Plug the equipment into an outlet that is on a different circuit than the TV or radio. (That is, make certain the equipment and the radio or television set are on circuits controlled by different circuit breakers or fuses.)
- Consider installing a rooftop television antenna with coaxial cable lead-in between the antenna and TV. If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission:
  "How to Identify and Resolve Radio — TV Interference Problems"
  This booklet is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock No. 004-000-00345-4.

For Canada

CLASS B **NOTICE**

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

CLASSE B **AVIS**

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Réglement des signaux parasites par le ministère canadien des Communications.

Thank you for purchasing the Roland LA/PCM Sound Module CM-64. To make the best use of the CM-64, please read this owner's manual carefully.

■ *CONTENTS*

Please read the separate "Guidebook for MIDI" before reading this owner's manual.

Features of the CM-64

The following describes the features of the CM-64.

●The CM-64 adopts LA sound synthesis and PCM sound module that create high quality sounds

The LA synthesis involves a great many technological advances that have been proved in the D-50 and D-20. The PCM sound module similar to the U-110 is also built in the CM-64. You can use either of the sound modules depending what kind of music you wish to create.

●Sound Modules that are ideal for computer music

The CM-64's LA sound section is a multi timbral sound module that consists of 9 different Parts (including one Rhythm Part) and the PCM sound module consists of 6 different Parts. In other words, one CM-64 works as 15 separate sound modules. The compact and simply designed body may be ideal for computer music.

Also, the CM-64 is almost the same as the MT-32 with PCM sound module built-in, and therefore can use the application software of the MT-32.

●The CM-64 can produce a maximum of 63 voices

Because the CM-64 can produce a maximum of 63 voices using the LA and PCM sound modules, you can enjoy high level ensemble performance.

●Rhythm Part is provided specifically for rhythm performance

The Rhythm Part in the LA sound module features various drum and percussive voices, allowing you to enjoy wide variations of rhythm performance. It also includes SE's (sound effects) such as a laughing voice or explosion for you to create unique performance.

●The CM-64 features a great many sounds

The LA sound section of the CM-64 stores 128 different instrument sounds, 30 rhythm sounds and 33 SE's (sound effects). The PCM section stores 64 different sounds, and another 64 sounds can be available using an optional PCM Card.

●The built-in Digital Reverb creates realistic reverb effect

The CM-64's digital reverb adds spaciousness and richness to the sounds.

Important Notes

When employing an AC adaptor, make certain you use only one that has been supplied by the manufacturer. Use of any other power adaptor could result in malfunction or damage.

[Concerning the power supply]

- Whenever you make any connections with other devices, always turn off the power to all equipment first. This will help in preventing malfunction, and damage to speakers.

- Do not force the unit to share the same power outlet as one used for distortion producing devices (such as motors, variable lighting devices). Be sure to use a separate power outlet.

- Before using the AC adaptor, always make certain the voltage of the available power supply conforms to its rating.

- Do not place heavy objects onto, step on, or otherwise risk causing damage to the power cord.

- Whenever you disconnect the AC adaptor from the outlet, always grasp it by the plug, to prevent internal damage to the cord and the hazard of possible short circuits.

- If the unit is not to be used for a long period of time, unplug the cord from the socket.

[Concerning placement]

- Avoid using or storing the unit in the following places, as damage could result.

  - ○Places subject to extremes in temperature. (Such as under direct sunlight, near heating units, above equipment generating heat, etc.)

  - ○Places near water and moisture. (Baths, washrooms, wet floors, etc.) Places otherwise subject to high humidity.

  - ○Dusty environments.

  - ○Places where high levels of vibration are produced.

- Placing the unit near power amplifiers or other equipment containing large transformers may induce hum.

- Should the unit be operated nearby television or radio receivers, TV pictures may show signs of interference, and static might be heard on radios. In such cases, move the unit out of proximity with such devices.

[Maintenance]

- For everyday cleaning, wipe the unit with a soft dry cloth, or one that is dampened slightly. To remove dirt that is more stubborn, wipe using a mild, neutral detergent. Afterwards, make sure to wipe thoroughly with a soft cloth.

- Never apply benzene, thinners, alcohol or any like agents, to avoid the risk of discoloration and deformation.

[Other Precautions]

- Protect the unit from strong impact.

- Avoid getting any foreign objects (coins, wire, etc.), or liquids (water, drinks, etc.) into the unit.

- A certain small amount of heat will be radiated from the unit, and thus should not beconsidered abnormal.

- Before using the unit in a foreign country, check first with your local Roland Service Station.

- At any time that you notice a malfunction, or otherwise suspect there is damage, immediately refrain from using the unit. Then contact the store where bought, or the nearest Roland Service Station.

- Since the unit is equipped with a circuit protection device, it requires a brief interval after power is turned on before it can be operated.

1. Panel Description

(1)Front Panel

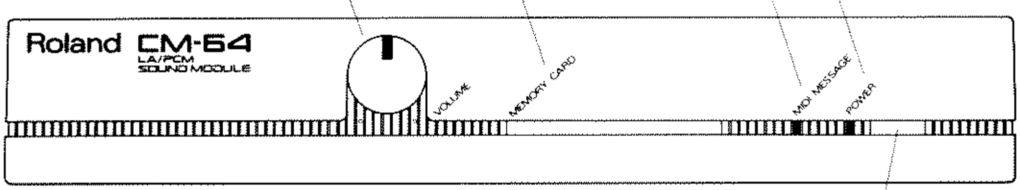
VOLUME (Volume Control Knob)
This adjusts the overall volume which is the output from the Output Jacks or Headphone Jack. Rotating the knob clockwise will increase the volume, and rotating it counterclockwise will decrease it.

* The volume balance of the individual Part can be controlled with the MIDI Volume (Control Change) messages.

MEMORY CARD (PCM Card Slot)
Insert an optional PCM Card (Sound Library: SN-U110 Series) to this slot. Using a PCM Card, you can use another 64 sounds in addition to those in the internal memory.

MIDI MESSAGE (MIDI Message Indicator)
This lights up when the MIDI message is received.

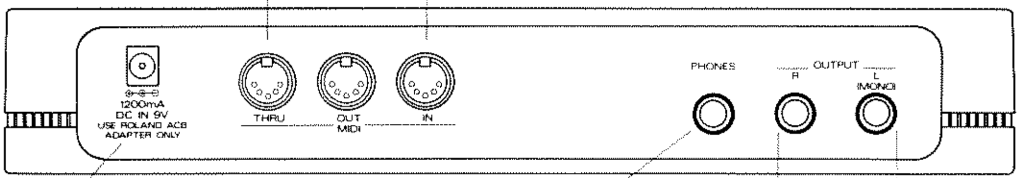
POWER (Power Indicator)
This lights up when the unit is switched on.



POWER SWITCH

(2)Rear Panel

MIDI IN/OUT/THRU (MIDI Sockets)
Connect MIDI devices to these sockets.



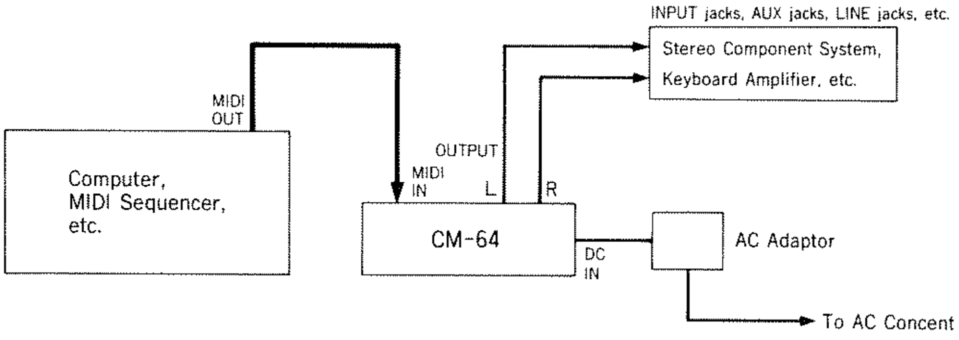
DC IN (AC Adaptor Jack)
Connect the supplied AC adaptor to this jack.

PHONES (Headphone Jack)
Connect headphones to this jack. Use headphones of 8 to 150 ohm impedance, if possible. Even while the Headphone Jack is connected, the Output Jacks send signals just the same.

OUTPUT (Output Jacks)
Sounds of the CM-64 are output through these Output Jacks. The L and R jacks are provided, so use both of them for stereo output. For mono output, use the L (MONO) jack only.

2. Connections

To play the CM-64, connect the devices as shown below.



●MIDI Cable Connections

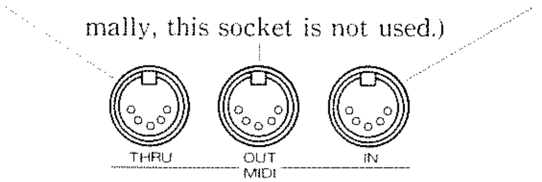
Connect the MIDI IN socket on the CM-64 to the MIDI OUT socket on the MIDI sequencer or a computer using a MIDI cable.

To use another MIDI sound module together with the CM-64, connect it to the MIDI THRU socket. However, do not connect more than three or four MIDI devices through MIDI THRU's. If more number of devices are connected, MIDI signals may not be received correctly causing malfunction of the entire system. If you wish to set up many number of devices through MIDI, use the MIDI Thru Box.

MIDI THRU : Transmits an exact copy of the messages received at MIDI IN.

MIDI OUT : Transmits MIDI messages to an external MIDI device. (Normally, this socket is not used.)

MIDI IN : Receives MIDI messages sent from an external device.

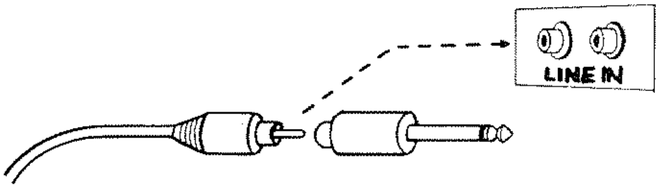


●Audio Cable Connections

Connect the Output Jacks of the CM-64 to the input jacks of the keyboard amplifier or stereo component system using an audio cable. The CM-64 features stereo outputs, but use the L(MONO) jack only for mono output.

When connecting the CM-64 to a keyboard amplifier or an electronic piano that features an external input jack : If it features an input level selector switch, set it to "H".

When connecting the CM-64 to a stereo component system : Connect the CM-64 to the LINE IN or AUX IN (input jack). When the input jack is pin jack type, remove the adaptor from the audio cable of accessory.

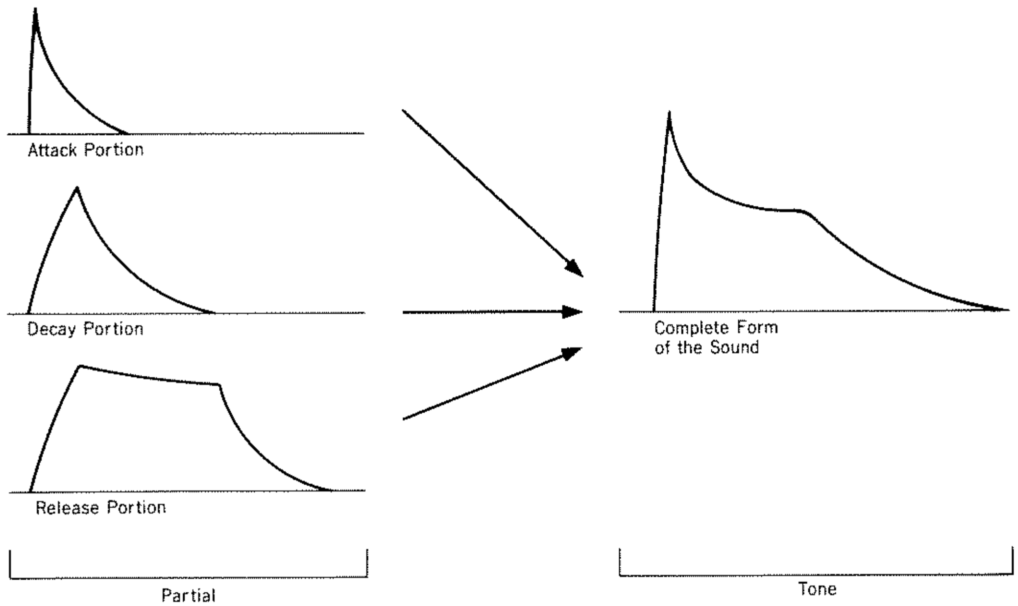


3. Structure of the CM-64

The following briefly explains the structure of the CM-64.

(1)LA Sound Module

LA stands for Linear Arithmetic synthesis which is the heart of the new technology. LA synthesis involves a great many technological advances resulting not only in a superior sound quality but also an improved ease of programming.
The LA system uses Partials to create wide varieties of sounds. A Partial may be called the smallest element of a sound. For instance, a sound may be made by three elements (Partials); attack, decay and release.

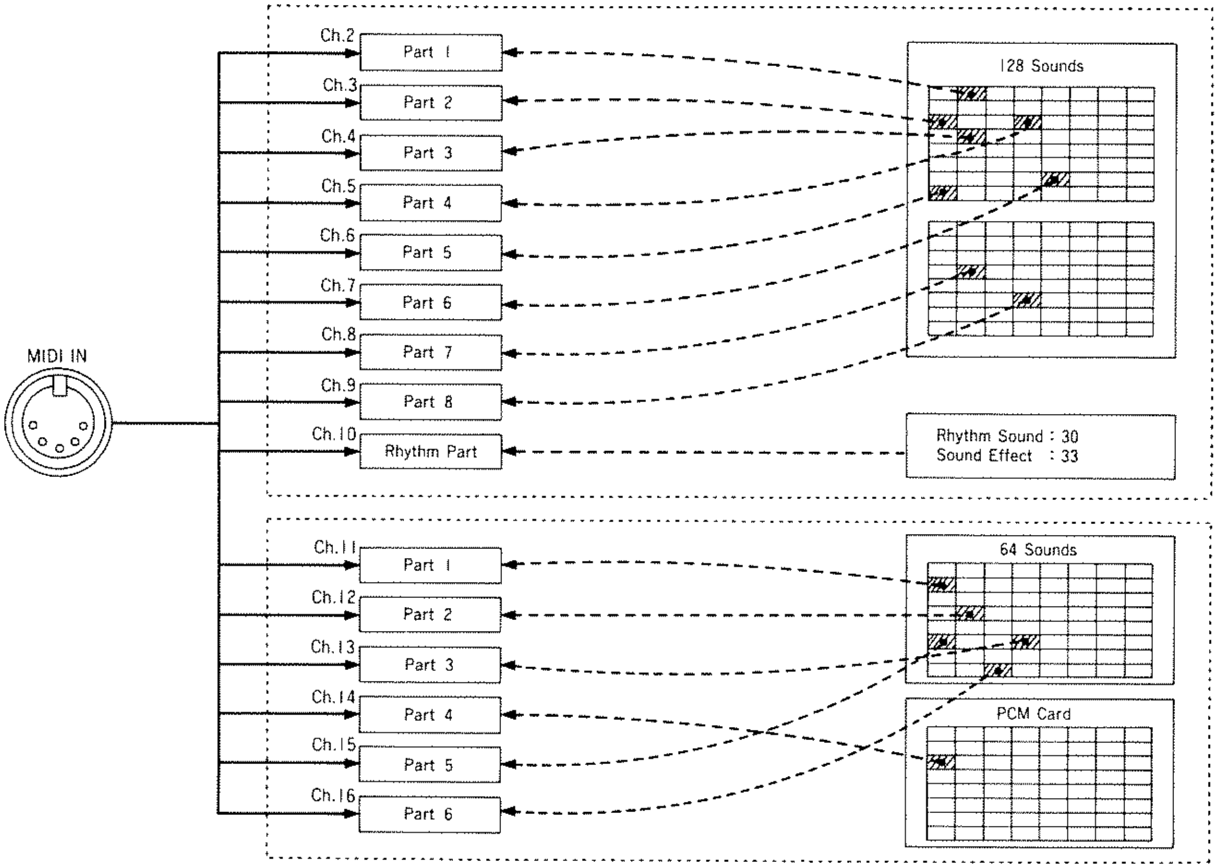


(2)PCM Sound Module

PCM stands for Pulse Code Modulation. PCM sound module records real sounds such as a piano or sax digitally, and play back the recorded sounds. The PCM sound module on the CM-64 modified the recorded sounds so that even more realistic acoustic sounds can be created.

(3)Structure of the Sound Modules

The CM-64 has two multi timbral sound modules ; LA sound module that consists of 9 Parts (including the Rhythm Part) and PCM sound module that consists of 6 Parts. Each Part is controlled by information received on an individual MIDI channel. So, you must set the receive channel of each Part to the same number as the transmit channel of the external MIDI device. Using a computer or MIDI sequencer that can send more than one MIDI channel messages, you can enjoy ensemble performance with different Parts.



●Part

The CM-64 stores 128 different sounds in the LA sound section and 64 sounds in the PCM sound section. Any of the LA sounds can be assigned to each of 1 - 8 Parts in the LA sound module, while any of the PCM sounds can be assigned to each of 1 - 6 Parts in the PCM sound module. Sounds in each Part can be changed by MIDI Program Change messages.

In the Rhythm Part of the LA sound module, 63 different rhythm sounds and SE's (sound effects) are assigned to the note numbers.

●Partial

The CM-64 can produce a maximum of 63 voices : 32 voices in the LA sound section using 32 Partials, and 31 voices in the PCM sound section using 31 Partials. Each sound uses a different number of Partials, and the maximum number of voices that can be played at the same time will vary depending on the number of Partials used in the sound. For details, see page 19 "8. Maximum Voices".

4.Sounds in the LA Sound Module

Part 1 - 8 in the LA sound module can use the following sounds.

(1)Sounds of Part 1 - 8

Part 1 to 8 can use the following sounds :

PROG#	TONE	Ptl#	PROG#	TONE	Ptl#
1/00 H	AcouPiano 1	4	33/20 H	Fantasy	3
2/01 H	AcouPiano 2	2	34/21 H	Harmo Pan	3
3/02 H	AcouPiano 3	1	35/22 H	Chorale	3
4/03 H	ElecPiano 1	3	36/23 H	Glasses	2
5/04 H	ElecPiano 2	2	37/24 H	Soundtrack	4
6/05 H	ElecPiano 3	2	38/25 H	Atmosphere	4
7/06 H	ElecPiano 4	1	39/26 H	Warm Bell	4
8/07 H	Honkytonk	3	40/27 H	Funny Vox	1
9/08 H	Elec Org 1	3	41/28 H	Echo Bell	3
10/09 H	Elec Org 2	3	42/29 H	Ice Rain	3
11/0 AH	Elec Org 3	2	43/2 AH	Oboe 2001	2
12/0 BH	Elec Org 4	2	44/2 BH	Echo Pan	2
13/0 CH	Pipe Org 1	3	45/2 CH	DoctorSolo	2
14/0 DH	Pipe Org 2	3	46/2 DH	Schooldaze	2
15/0 EH	Pipe Org 3	2	47/2 EH	Bellsinger	1
16/0 FH	Accordion	2	48/2 FH	SquareWave	2
17/10 H	Harpsi 1	4	49/30 H	Str Sect 1	4
18/11 H	Harpsi 2	3	50/31 H	Str Sect 2	3
19/12 H	Harpsi 3	1	51/32 H	Str Sect 3	2
20/13 H	Clavi 1	3	52/33 H	Pizzicato	3
21/14 H	Clavi 2	2	53/34 H	Violin 1	3
22/15 H	Clavi 3	1	54/35 H	Violin 2	2
23/16 H	Celesta 1	4	55/36 H	Cello 1	3
24/17 H	Celesta 2	2	56/37 H	Cello 2	2
25/18 H	SynBrass 1	2	57/38 H	Contrabass	2
26/19 H	SynBrass 2	3	58/39 H	Harp 1	3
27/1 AH	SynBrass 3	2	59/3 AH	Harp 2	2
28/1 BH	SynBrass 4	2	60/3 BH	Guitar 1	2
29/1 CH	Syn Bass 1	2	61/3 CH	Guitar 2	2
30/1 DH	Syn Bass 2	2	62/3 DH	Elec Gtr 1	4
31/1 EH	Syn Bass 3	2	63/3 EH	Elec Gtr 2	3
32/1 FH	Syn Bass 4	1	64/3 FH	Sitar	4

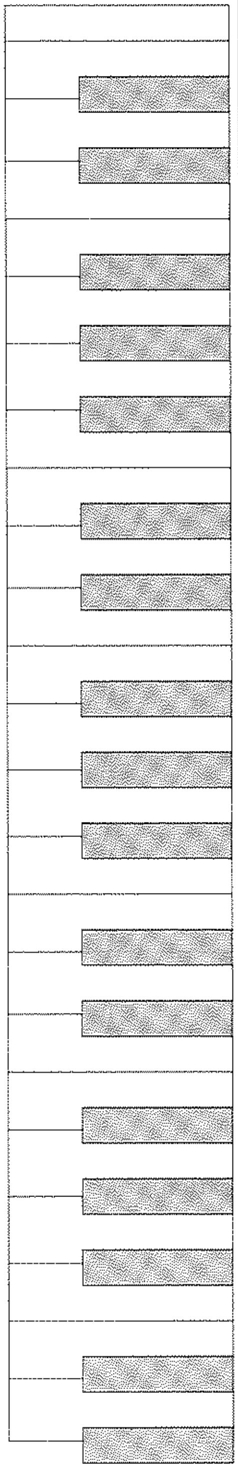
PROG#	TONE	Ptl#	PROG#	TONE	Ptl#
65/40 H	AcouBass 1	2	97/60 H	Brs Sect 2	3
66/41 H	AcouBass 2	1	98/61 H	Vibe 1	3
67/42 H	ElecBass 1	2	99/62 H	Vibe 2	2
68/43 H	ElecBass 2	1	100/63 H	Syn Mallet	1
69/44 H	SlapBass 1	3	101/64 H	Windbell	3
70/45 H	SlapBass 2	2	102/65 H	Glock	2
71/46 H	Fretless 1	4	103/66 H	Tube Bell	4
72/47 H	Fretless 2	2	104/67 H	Xylophone	1
73/48 H	Flute 1	4	105/68 H	Marimba	3
74/49 H	Flute 2	2	106/69 H	Koto	2
75/4 AH	Piccolo 1	3	107/6 AH	Sho	4
76/4 BH	Piccolo 2	2	108/6 BH	Shakuhachi	4
77/4 CH	Recorder	2	109/6 CH	Whistle 1	2
78/4 DH	Pan Pipes	3	110/6 DH	Whistle 2	1
79/4 EH	Sax 1	4	111/6 EH	Bottleblow	4
80/4 FH	Sax 2	3	112/6 FH	Breathpipe	3
81/50 H	Sax 3	2	113/70 H	Timpani	2
82/51 H	Sax 4	1	114/71 H	MelodicTom	1
83/52 H	Clarinet 1	3	115/72 H	Deep Snare	2
84/53 H	Clarinet 2	2	116/73 H	ElecPerc 1	2
85/54 H	Oboe	2	117/74 H	ElecPerc 2	2
86/55 H	Engl Horn	2	118/75 H	Taiko	3
87/56 H	Bassoon	2	119/76 H	Taiko Rim	1
88/57 H	Harmonica	2	120/77 H	Cymbal	2
89/58 H	Trumpet 1	3	121/78 H	Castanets	2
90/59 H	Trumpet 2	2	122/79 H	Triangle	2
91/5 AH	Trombone 1	3	123/7 AH	Orche Hit	4
92/5 BH	Trombone 2	2	124/7 BH	Telephone	1
93/5 CH	Fr Horn 1	3	125/7 CH	Bird Tweet	1
94/5 DH	Fr Horn 2	2	126/7 DH	OneNoteJam	4
95/5 EH	Tuba	2	127/7 EH	WaterBells	3
96/5 FH	Brs Sect 1	4	128/7 FH	JungleTune	4

PROG#: MIDI Program Change Number (decimal indication / hexadecimal indication).
Ptl #: The number of partials used for a sound.

*The number of partials used for a sound means the number of partials needed to play one note of the sound.

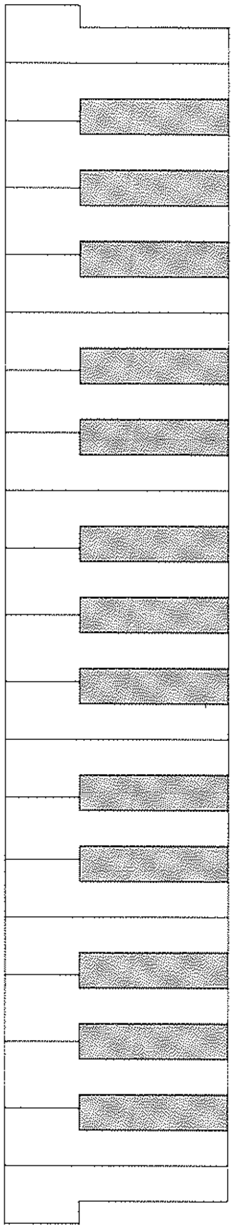
(2)Sounds of the Rhythm Part

The following rhythm sounds and SE's are assigned to note numbers of the Rhythm Part.



Note Name(#)	Tone name	Ptl#	Pan	Left Center Right
B 1(35/23H)	Acoustic Bass Drum	1	><	
C 2(36/24H)	Acoustic Bass Drum	1	><	
C#2(37/25H)	Rim Shot	1	<1	
D 2(38/26H)	Acoustic Snare Drum	1	><	
D#2(39/27H)	Hand Clap	1	1>	
E 2(40/28H)	Electronic Snare Drum	1	<1	
F 2(41/29H)	Acoustic Low Tom	1	4>	
F#2(42/2AH)	Closed High Hat	1	<1	
G 2(43/2BH)	Acoustic Low Tom	1	4>	
G#2(44/2CH)	Open High Hat 2	2	<1	
A 2(45/2DH)	Acoustic Middle Tom	1	1>	
A#2(46/2EH)	Open High Hat 1	2	<1	
B 2(47/2FH)	Acoustic Middle Tom	1	1>	
C 3(48/30H)	Acoustic High Tom	1	<4	
C#3(49/31H)	Crash Cymbal	2	<1	
D 3(50/32H)	Acoustic High Tom	1	<4	
D#3(51/33H)	Ride Cymbal	1	1>	
E 3(52/34H)				
F 3(53/35H)				
F#3(54/36H)	Tambourine	1	2>	
G 3(55/37H)				
G#3(56/38H)	Cowbell	1	><	
A 3(57/39H)				
A#3(58/3AH)				
B 3(59/3BH)				
C 4(60/3CH)	High Bongo	1	<5	
C#4(61/3DH)	Low Bongo	1	<3	
D 4(62/3EH)	Mute High Conga	1	1>	
D#4(63/3FH)	High Conga	1	2>	
E 4(64/40H)	Low Conga	1	3>	
F 4(65/41H)	High Timbale	1	><	
F#4(66/42H)	Low Timbale	1	<2	
G 4(67/43H)	High Agogo	1	<5	
G#4(68/44H)	Low Agogo	1	<5	
A 4(69/45H)	Cabasa	1	2>	
A#4(70/46H)	Maracas	1	<3	
B 4(71/47H)	Short Whistle	2	2>	
C 5(72/48H)	Long Whistle	2	2>	
C#5(73/49H)	Quijada	3	3>	
D 5(74/4AH)				
D#5(75/4BH)	Claves	1	5>	

*Rhythm sounds ignore the Note Off message (No sustain).



Note Name(#)	Tone name	Ptl#	Pan	Left　　Center　　Right
E 5(76/4CH)	Laughing	1	><	●
F 5(77/4DH)	Screaming	1	><	●
F#5(78/4EH)	Punch	1	><	●
G 5(79/4FH)	Heartbeat	1	><	●
G#5(80/50H)	Footsteps 1	1	><	●
A 5(81/51H)	Footsteps 2	1	><	●
A#5(82/52H)	Applause	3	><	●
B 5(83/53H)	Creaking	1	><	●
C 6(84/54H)	Door	1	><	●
C#6(85/55H)	Scratch	4	><	●
D 6(86/56H)	Windchime	2	><	●
D#6(87/57H)	Engine	2	><	●
E 6(88/58H)	Car-stop	1	><	●
F 6(89/59H)	Car-pass	4	><	●
F#6(90/5AH)	Crash	4	><	●
G 6(91/5BH)	Siren	2	><	●
G#6(92/5CH)	Train	2	><	●
A 6(93/5DH)	Jet	4	><	●
A#6(94/5EH)	Helicopter	4	><	●
B 6(95/5FH)	Starship	4	><	●
C 7(96/60H)	Pistol	2	><	●
C#7(97/61H)	Machinegun	2	><	●
D 7(98/62H)	Lasergun	2	><	●
D#7(99/63H)	Explosion	4	><	●
E 7(100/64H)	Dog	1	><	●
F 7(101/65H)	Horse	2	><	●
F#7(102/66H)	Birds	4	><	●
G 7(103/67H)	Rain	4	><	●
G#7(104/68H)	Thunder	3	><	●
A 7(105/69H)	Wind	3	><	●
A#7(106/6AH)	Waves	4	><	●
B 7(107/6BH)	Stream	4	><	●
C 8(108/6CH)	Bubble	3	><	●

Ptl#: The number of partials used for a sound.
Pan: Pan value.

* Pan determines the sound positioning of stereo output. SE (after Laughing) sounds are all set to the center panning, but some sounds are played in different pannings.

* The number of Partials used for a sound means the partials needed to play a note of the sound.

5. Sounds in the PCM Sound Module

Part 1 - 6 in the PCM sound module can use the following sounds.

(1)Sounds of Part 1 - 6

The CM-64 stores 64 different PCM sounds. Using an optional PCM Card (Sound Library SN-U110 Series), another 64 sounds are available.

The following are the 64 PCM sounds stored in the internal memory :

PROG#	TONE	Ptl#	Tone Type	Split/ Threshold	Contents
1/00H	A.PIANO 1	2	V-MIX		Mellow tone
2/01H	A.PIANO 2	2	V-MIX		
3/02H	A.PIANO 3	2	V-MIX		Bright tone
4/03H	A.PIANO 4	2	V-MIX		Honky tonk piano
5/04H	A.PIANO 5	1	SINGLE		Soft touch
6/05H	A.PIANO 7	1	SINGLE		Hard touch
7/06H	A.PIANO 9	1	SINGLE		Hard touch and bright tone
8/07H	E.PIANO 1	2	V-MIX		Soft and hard touch
9/08H	E.PIANO 3	2	DETUNE		Soft touch
10/09H	E.PIANO 5	2	DETUNE		Hard touch
11/0AH	A.GUITAR 1	1	SINGLE		
12/0BH	A.GUITAR 3	2	DUAL		
13/0CH	A.GUITAR 4	2	DUAL		Includes the sound one octave lower
14/0DH	E.GUITAR 1	1	V-SW	v=100	Mute/Non-mute
15/0EH	E.GUITAR 2	1	SINGLE		Mute
16/0FH	SLAP 3	1	SINGLE	B 2(47)	
17/10H	SLAP 4	2	DETUNE	B 2(47)	Thump/pull * The keys more than F#4(66) contains the harmonics sound.
18/11H	SLAP 5	1	V-SW	v=100	
19/12H	SLAP 6	1	V-SW	v=100	Slow attack/Fast attack * The keys more than F#4(66) contains the harmonics sound.
20/13H	SLAP 9	1	SINGLE	B 2(47)	
21/14H	SLAP 10	2	DETUNE	B 2(47)	Thump/pull * The keys more than C#4(61) contains the harmonics sound.
22/15H	SLAP 11	1	V-SW	v=100	
23/16H	SLAP 12	1	V-SW	v=100	Slow attack/Fast attack * The keys more than C#4(61) contains the harmonics sound.
24/17H	FINGERED 1	1	SINGLE		* The keys more than C#5(73) contains the harmonics sound.
25/18H	FINGERED 2	2	DETUNE		
26/19H	PICKED 1	1	SINGLE		
27/1AH	PICKED 2	2	DETUNE		
28/1BH	FRETLESS 1	1	SINGLE		* The keys more than D#6(87) contains the harmonics sound.
29/1CH	AC.BASS	2	V-MIX		Fret-noise is slightly mixed.
30/1DH	CHOIR 1	1	SINGLE		Long release
31/1EH	CHOIR 2	1	SINGLE		Short release
32/1FH	CHOIR 3	2	DUAL		Long release (Includes the sound one octave lower)
33/20H	CHOIR 4	2	DUAL		Short release (Includes the sound one octave lower)
34/21H	STRINGS 1	1	SINGLE		Long release

PROG#	TONE	Ptl#	Tone Type	Split/ Threshold	Contents
35/22H	STRINGS 2	1	SINGLE		Short release
36/23H	STRINGS 3	2	DUAL		Long release (Includes the sound one octave lower)
37/24H	STRINGS 4	2	DUAL		Short release (Includes the sound one octave lower)
38/25H	E.ORGAN 2	2	DETUNE		
39/26H	E.ORGAN 4	2	DETUNE		
40/27H	E.ORGAN 6	2	DETUNE		
41/28H	E.ORGAN 8	2	DETUNE		
42/29H	E.ORGAN 9	2	DUAL		
43/2AH	E.ORGAN 10	2	DUAL		
44/2BH	E.ORGAN 11	2	DUAL		
45/2CH	E.ORGAN 12	2	DUAL		
46/2DH	E.ORGAN 13	2	DUAL		
47/2EH	SOFT TP 1	1	SINGLE		
48/2FH	SOFT TP 3	1	SINGLE		Sforzand piano
49/30H	TP / TRB 1	1	SINGLE		
50/31H	TP / TRB 2	1	SINGLE		Mellow tone
51/32H	TP / TRB 3	1	SINGLE		Bright tone
52/33H	TP / TRB 4	1	SINGLE		Sforzand piano
53/34H	TP / TRB 5	2	DETUNE		
54/35H	TP / TRB 6	2	DUAL		Includes the sound one octave lower
55/36H	SAX 1	1	SINGLE		
56/37H	SAX 2	1	SINGLE		Mellow tone
5738H	SAX 3	1	SINGLE		Bright tone
58/39H	SAX 5	2	DUAL		Includes the sound one octave lower
59/3AH	BRASS 1	1	SINGLE		
60/3BH	BRASS 2	1	SINGLE		Sforzand piano
61/3CH	BRASS 3	2	DUAL		Includes the sound one octave lower
62/3DH	BRASS 4	2	DUAL		BRASS & SAX
63/3EH	BRASS 5	2	DUAL		TP / TRB & SAX
64/3FH	ORCH HIT	1	SINGLE		
65/40H : 128/7FH	PCM Card				

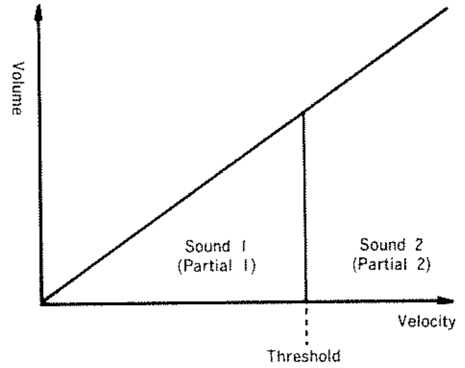
PROG#: MIDI Program Change Number (decimal indication / hexadecimal indication).
Ptl #: The number of partials used for a sound.

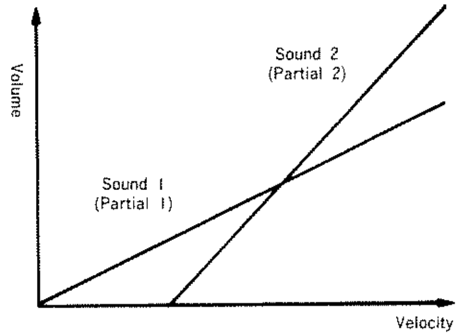
* The Program Change numbers 65 - 128 can select sounds on a PCM Card.

(2)Sound Types

There are five sound types depending how the sound uses partials.

Tone Type	Ptl#	Contents
SINGLE	1	Sound made of one partial.
DETUNE	2	Sound made of two slightly different pitches.
DUAL	2	Sound made of two different sounds.
V-SW (Velocity Switch)	1	One of two sounds is played depending on the strength of the keyboard playing (see the picture shown below).
V-MIX (Velocity Mix)	2	The volume balance of two sounds is changed depending on the velocity value (see the picture shown below).

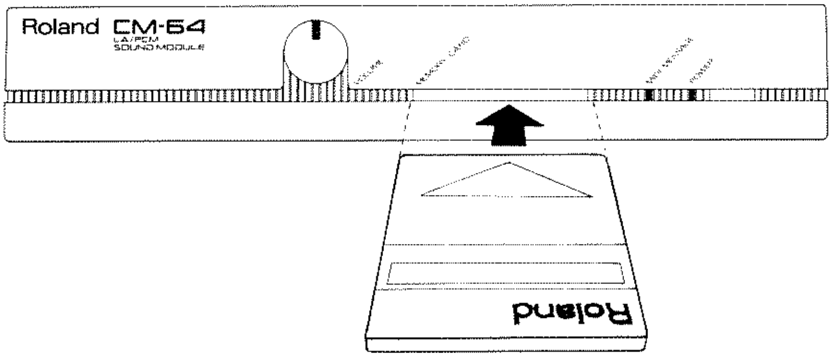




The level (velocity) where two sounds are switched is called threshold. "v= * *" in the Sound List represents the velocity value at the threshold.

(3)How to use the PCM Cards

When using an optional PCM Card, insert the card securely into the card slot in correct directions.



6. Control via MIDI

The following explains the MIDI messages that the CM-64 uses and how to use the messages.

* The following indicates the values of MIDI messages in decimal and hexadecimal. You may use either of them depending on the MIDI device you use.

64/40H

Decimal indication   Hexadecimal indication (with H at the end)

(1)MIDI Channel of each Part

The MIDI channel of each Part of the CM-64 is set as shown below. You must set the transmit channel of the external MIDI device to the receive channel of the relevant Part.

	LA Sound Section									PCM Sound Section					
Part	1	2	3	4	5	6	7	8	Rhythm	1	2	3	4	5	6
MIDI Channel	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

(2)MIDI messages that the individual Part can receive

Each Part can receive the following MIDI messages:

●Note Messages

Note messages are for playing the keyboard. In the Rhythm Part, various different drum voices and SE's can be played.

●Pitch Bender Messages

Pitch Bender messages control the Pitch Bend lever or Pitch Bend wheel, changing the pitch continuously.

●Program Change Messages

These are for changing sounds. The sounds in the Part that receives Program Change messages will change depending the received Program Change numbers. (The Program Change messages are ignored in the Rhythm Part.)

* Roland uses Program Change numbers 1 to 128, but some softwares or sequencers use 0 to 127 numbers. So please be careful.

●Control Change Messages

These are for controlling various parameters and functions. Each Control number has its own function. The CM-64 can receive the following Control Change messages:

Modulation (Control Number: 1/01H)

This controls the depth of vibrato effect. This value is set individually for each sound.

Data Entry (Control Number : 6/06H)

This is used for setting the RPN.

Volume (Control Number : 7/07H)

This controls the volume of each Part, adjusting the volume balance between Parts. The actual volume is determined by the value of expression (Control Number 11), volume (Control Number 7) and Master Volume (Exclusive messages) and the position of Volume control knob.

Pan (Control Number : 10/0AH)

This controls the sound positioning of stereo output. (This information is ignored in the Rhythm Part.)

In the LA sound module section, 15 levels are normally valid for the pan value, but only 8 levels are valid when you use a certain sound. In the PCM sound module section, the pan value can be changed continuously.

7 >	6 >	5 >	4 >	3 >	2 >	1 >	><	< 1	< 2	< 3	< 4	< 5	< 6	< 7
7 >	5 >		3 >		1 >		< 1		< 3		< 5		< 7	
119-127	111-118	102-110	94-101	85-93	77-84	68-76	60-67	51-59	43-50	34-42	26-33	17-25	9-16	0-8
77H-7FH	6FH-76H	66H-6EH	5EH-65H	55H-5DH	4DH-54H	44H-4CH	3CH-43H	33H-3BH	2BH-32H	22H-2AH	1AH-21H	11H-19H	09H-10H	00H-08H

Expression (Control Number : 11/0BH)

This controls the volume of each Part. The actual volume is determined by the values of expression (Control Number 11), volume (Control Number 7) and Master Volume (Exclusive messages) and the position of Volume control knob.

Hold 1 (Control Number : 64/40H)

This sustains the sound currently played, just like a damper pedal of a piano.

RPN (Control Number : 100/64H& 101/65H)

RPN stands for Registered Parameter Number. In the CM-64, the bender range of each Part can be controlled with the RPN number 0, Pitch Bend Sensitivity.

Reset All Controllers (Control Number : 121/79H)

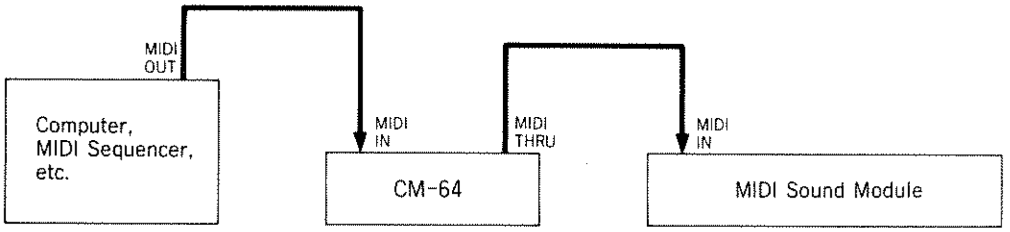
This returns the Modulation, Expression, Hold 1 and Pitch Bender parameters to the default settings. The Part received this message will be set as shown below :

Modulation	0/00H	Min
Expression	127/7FH	Max
Hold 1	0/00H	Off
Pitch Bender	±0/2000H	Center

(3)Advanced Control via MIDI

●Using another MIDI sound module

If you wish to increase the number of sounds using another MIDI sound module, make connections as follows. Set the MIDI receive channel of the connected sound module to 1.



●Bender Range Control with RPN

The CM-64 allows you to control the bender range of each Part using the RPN (Registered Parameter Number). To do that, send Control Change messages from an external MIDI device in the sequence as shown below :

① RPN MSB (Control Number : 100／64H) 0／00H
② RPN LSB (Control Number : 101／65H) 0／00H
③ Data Entry (Control Number : 6／06H) vv

*vv is the value of the bender range to be set. It can be set in semi-tone steps within 2 octaves (0 - 24／00H - 18H) in the LA sound section and in semi-tone steps within 1 octave (0 - 12／00H - 0CH) in the PCM sound section.

<Example> To set the bender range of Part 4 (MIDI channel 5) to 12 (1 octave) :

	MIDI ch	Control Number	Data	MIDI Message
① RPN MSB	5	100/64 H	0/00 H	B 4 H, 64 H, 00 H
② RPN LSB	5	101/65 H	0/00 H	B 4 H, 65 H, 00 H
③ Data Entry	5	6/06 H	12/0 CH	B 4 H, 06 H, 0 CH

*Some types of MIDI sequencer transmits Control Change numbers of the same step (timing) in the sequence of smaller number to a larger number. If you use this type of sequencer, be sure to set it so that the Control Change will be sent in the sequence of RPN MSB - RPN LSB - Data Entry by shifting the position of the RPN forward, etc.

●Control Using the Exclusive Messages

Exclusive messages are messages exclusive to a particular manufacturer, such as sound data and setup data. Various parameters can be controlled using the Exclusive messages. For details, see the MIDI Implementation at the back of this owner's manual.

7. Default Settings at Power-on

The CM-64 is default to the following values. (Any programs you have made will be erased when the unit is switched off.)

		Sound	Pan	Volume	Expression
LA Sound Section	Part 1	Slap Bass 1	54/36 H	100/64 H	127/7 F H
	Part 2	Str Sect 1	54/36 H	100/64 H	127/7 F H
	Part 3	Brs Sect 1	54/36 H	100/64 H	127/7 F H
	Part 4	Sax 1	54/36 H	100/64 H	127/7 F H
	Part 5	Ice Rain	18/12 H	100/64 H	127/7 F H
	Part 6	Elec Piano 1	91/5 BH	100/64 H	127/7 F H
	Part 7	Bottleblow	0/00 H	100/64 H	127/7 F H
	Part 8	Orche Hit	127/7 FH	100/64 H	127/7 F H
	Rhythm Part	-----	--	100/64 H	127/7 F H
PCM Sound Section	Part 1	FRETLESS 1	64/40 H	100/64 H	127/7 F H
	Part 2	CHOIR 1	81/51 H	100/64 H	127/7 F H
	Part 3	A. PIANO 1	64/40 H	100/64 H	127/7 F H
	Part 4	E. ORGAN 1	99/63 H	100/64 H	127/7 F H
	Part 5	E. GUITAR 1	27/1 BH	100/64 H	127/7 F H
	Part 6	SOFT TP 1	45/2 DH	100/64 H	127/7 F H

8. Maximum Voices

As previously explained in "3. Structure of the CM-64", a sound is made of number of Partials and the CM-64 produces sounds using Partials. The maximum voices that it can produce simultaneously will vary depending on the number of Partials used for the sound. The following explains the relation between the Partials and the maximum voices of the CM-64.

(1)Partials and the maximum number of voices

The LA sound section allows you to use 32 Partials and the PCM section allows you to use 31 Partials at the same time.

For example, if you play three sounds which are made of two Partials, six Partials will be used altogether (2 Partials × 3). In other words, when the CM-64 is used as a multi timbral sound module, it uses (the number of Partials assigned to Part 1) × (the number of voices currently playing in Part 1), that is the total number of Partials used in each Part. However, the LA and PCM sound sections use Partials separately, you should count the number of Partials for each sound section individually. In the Rhythm Part, the number of Partial used in each rhythm sound is different, therefore, count the total number of Partials used for the rhythm sound currently playing.

As long as you are using Partials within the maximum number of each Sound section, there is no inconvenience caused. You may use all the Partials in one Part, if you like.

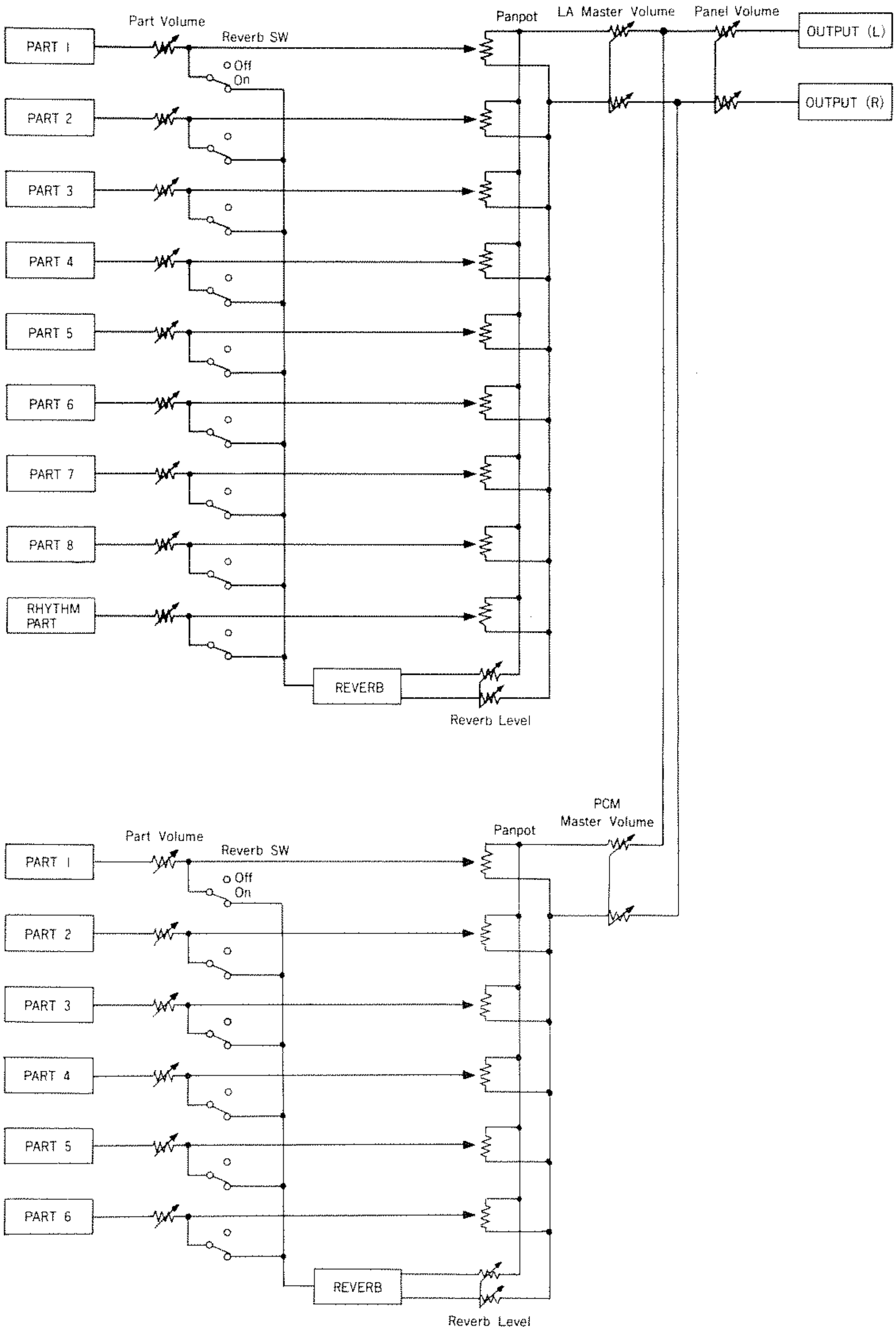
(2)Partial Reserve

The CM-64 can play any sound in any Part within 32 voices (Partials) in the LA sound module and 31 voices (Partials) in the PCM sound module. However, if you try to use more Partials, the Partial Reserve function sets the number of Partials which can be used for a certain Part prior to the other Parts. In other words, even when more key messages than reserved are sent, they will be put to work in the more important Part without being cut.

The Partial Reserve of the CM-64 is preprogrammed as shown below. The number of Partials in each Part represents the number of Partials which can be reserved on top of the maximum number of Partials. You may consider the Partial Reserve first, then determine what phrases should be played in what Part.

	Part	Partial Reserve
LA Sound Section	1	2
	2	10
	3	6
	4	4
	5	3
	6	0
	7	0
	8	0
	Rhythm	6
PCM Sound Section	1	2
	2	8
	3	21
	4	0
	5	0
	6	0

CM-64 Block Diagram



Roland Exclusive Messages

1. Data Format for Exclusive Messages

Roland's MIDI implementation uses the following data format for all exclusive messages (type IV):

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
CMD	Command ID
[BODY]	Main data
F7H	End of exclusive

MIDI status : F0H, F7H

An exclusive message must be flanked by a pair of status codes, starting with a Manufacturer - ID immediately after F0H (MIDI version1.0).

Manufacturer - ID : 41H

The Manufacturer - ID identifies the manufacturer of a MIDI instrument that triggers an exclusive message. Value 41H represents Roland's Manufacturer - ID.

Device - ID : DEV

The Device - ID contains a unique value that identifies the individual device in the multiple implementation of MIDI instruments. It is usually set to 00H - 0FH, a value smaller by one than that of a basic channel, but value 00H - 1FH may be used for a device with multiple basic channels.

Model - ID : MDL

The Model - ID contains a value that uniquely identifies one model from another. Different models, however, may share an identical Model - ID if they handle similar data.

The Model - ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Model - IDs, each representing a unique model:

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

Command - ID : CMD

The Command - ID indicates the function of an exclusive message. The Command - ID format may contain 00H in one or more places to provide an extended data field. The following are examples of valid Command - IDs, each representing a unique function:

01H
02H
03H
00H, 01H
00H, 02H
00H, 00H, 01H

Main data : BODY

This field contains a message to be exchanged across an interface. The exact data size and contents will vary with the Model - ID and Command - ID.

2. Address - mapped Data Transfer

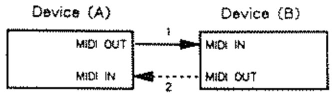
Address mapping is a technique for transferring messages conforming to the data format given in Section 1. It assigns a series of memory - resident records - - waveform and tone data, switch status, and parameters, for example - - to specific locations in a machine - dependent address space, thereby allowing access to data residing at the address a message specifies.

Address - mapped data transfer is therefore independent of models and data categories. This technique allows use of two different transfer procedures : one - way transfer and handshake transfer.

One - way transfer procedure (See Section 3 for details.)

This procedure is suited for the transfer of a small amount of data. It sends out an exclusive message completely independent of a receiving device status.

Connection Diagram

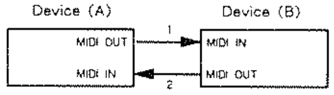


Connection at point 2 is essential for "Request data" procedures. (See Section 3.)

Handshake - transfer procedure (See Section 4 for details.)

This procedure initiates a predetermined transfer sequence (handshaking) across the interface before data transfer takes place. Handshaking ensures that reliability and transfer speed are high enough to handle a large amount of data.

Connection Diagram



Connection at points 1 and 2 is essential.

Notes on the above two procedures

*There are separate Command - IDs for different transfer procedures.

*Devices A and B cannot exchange data unless they use the same transfer procedure, share identical Device - ID and Model ID, and are ready for communication.

3. One - way Transfer Procedure

This procedure sends out data all the way until it stops and is used when the messages are so short that answerbacks need not be checked.

For long messages, however, the receiving device must acquire each message in time with the transfer sequence, which inserts intervals of at least 20 milliseconds in between.

Types of Messages

Message	Command ID
Request data 1	RQ1 (11H)
Data set 1	DT1 (12H)

Request data # 1 : RQ1 (11H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQ1 message, the remote device checks its memory for the data address and size that satisfy the request.

If it finds them and is ready for communication, the device will transmit a "Data set 1 (DT1)" message, which contains the requested data. Otherwise, the device will send out nothing.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
11H	Command ID
aaH : :	Address MSB : LSB
ssH : :	Size MSB : LSB
sum	Check sum
F7H	End of exclusive

*The size of the requested data does not indicate the number of bytes that will make up a DT1 message, but represents the address fields where the requested data resides.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model - ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

＝Data set 1 : DT1 (12H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, a DT1 message can convey the starting address of one or more data as well as a series of data formatted in an address - dependent order.

The MIDI standards inhibit non - real time messages from interrupting an exclusive one. This fact is inconvenient for the devices that support a "soft - through" mechanism. To maintain compatibility with such devices, Roland has limited the DT1 to 256 bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
12H	Command ID
aaH	Address MSB
:	:
	LSB
ddH	Data
:	:
sum	Check sum
F7H	End of exclusive

*A DT1 message is capable of providing only the valid data among those specified by an RQ1 message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The number of bytes comprising address data varies from one Model - ID to another.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

＝Example of Message Transactions

● Device A sending data to Device B
Transfer of a DT1 message is all that takes place.

Device (A) Device (B)

[Data set 1] ──────────►
* More than 20m sec time interval.
[Data set 1] ──────────►
:
[Data set 1] ──────────►

● Device B requesting data from Device A
Device B sends an RQ1 message to Device A. Checking the message, Device A sends a DT1 message back to Device B.

Device (A) Device (B)

[Data set 1] ◄────────── [Request data]
[Data set 1] ──────────►
* More than 20m sec time interval.
[Data set 1] ──────────►
:
[Data set 1] ──────────►

4. Handshake - Transfer Procedure

Handshaking is an interactive process where two devices exchange error checking signals before a message transaction takes place, thereby increasing data reliability. Unlike one - way transfer that inserts a pause between message transactions, handshake transfer allows much speedier transactions because data transfer starts once the receiving device returns a ready signal.

When it comes to handling large amounts of data - - sampler waveforms and synthesizer tones over the entire range, for example - - across a MIDI interface, handshaking transfer is more efficient than one - way transfer.

Types of Messages

Message	Command ID
Want to send data	WSD (40H)
Request data	RQD (41H)
Data set	DAT (42H)
Acknowledge	ACK (43H)
End of data	EOD (45H)
Communication error	ERR (4EH)
Rejection	RJC (4FH)

＝Want to send data : WSD (40H)

This message is sent out when data must be sent to a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of the data to be sent.

On receiving a WSD message, the remote device checks its memory for the specified data address and size which will satisfy the request. If it finds them and is ready for communication, the device will return an "Acknowledge (ACK)" message.
Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
40H	Command ID
aaH	Address MSB
:	:
	LSB
ssH	Size MSB
:	:
	LSB
sum	Check sum
F7H	End of exclusive

*The size of the data to be sent does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the data should reside.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model - ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

≡ Request data : RQD (41H)

This message is sent out when there is a need to acquire data from a device at the other end of the interface. It contains data for the address and size that specify designation and length, respectively, of data required.

On receiving an RQD message, the remote device checks its memory for the data address and size which satisfy the request. If it finds them and is ready for communication, the device will transmit a "Data set (DAT)" message, which contains the requested data. Otherwise, it will return a "Rejection (RJC)" message.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
41H	Command ID
aaH	Address MSB
:	:
:	LSB
ssH	Size MSB
:	:
:	LSB
sum	Check sum
F7H	End of exclusive

*The size of the requested data does not indicate the number of bytes that make up a "Data set (DAT)" message, but represents the address fields where the requested data resides.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The same number of bytes comprises address and size data, which, however, vary with the Model - ID.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

≡ Data set : DAT (42H)

This message corresponds to the actual data transfer process. Because every byte in the data is assigned a unique address, the message can convey the starting address of one or more data as well as a series of data formatted in an address - dependent order.

Although the MIDI standards inhibit non - real time messages from interrupting an exclusive one, some devices support a "soft - through" mechanism for such interrupts. To maintain compatibility with such devices, Roland has limited the DAT to 256 bytes so that an excessively long message is sent out in separate segments.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
42H	Command ID
aaH	Address MSB
:	:
:	LSB
ddH	Data
:	:
sum	Check sum
F7H	End of exclusive

*A DAT message is capable of providing only the valid data among those specified by an RQD or WSD message.
*Some models are subject to limitations in data format used for a single transaction. Requested data, for example, may have a limit in length or must be divided into predetermined address fields before it is exchanged across the interface.
*The number of bytes comprising address data varies from one model ID to another.
*The error checking process uses a checksum that provides a bit pattern where the least significant 7 bits are zero when values for an address, size, and that checksum are summed.

≡ Acknowledge : ACK (43H)

This message is sent out when no error was detected on reception of a WSD, DAT, "End of data (EOD)", or some other message and a requested setup or action is complete. Unless it receives an ACK message, the device at the other end will not proceed to the next operation.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
43H	Command ID
F7H	End of exclusive

≡ End of data : EOD (45H)

This message is sent out to inform a remote device of the end of a message. Communication, however, will not come to an end unless the remote device returns an ACK message even though an EOD message was transmitted.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
45H	Command ID
F7H	End of exclusive

≡ Communications error : ERR (4EH)

This message warns the remote device of a communications fault encountered during message transmission due, for example, to a checksum error. An ERR message may be replaced with a "Rejection (RJC)" one, which terminates the current message transaction in midstream.

When it receives an ERR message, the sending device may either attempt to send out the last message a second time or terminate communication by sending out an RJC message.

Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
4EH	Command ID
F7H	End of exclusive

≈ Rejection : RJC (4FH)

This message is sent out when there is a need to terminate communication by overriding the current message. An RJC message will be triggered when :

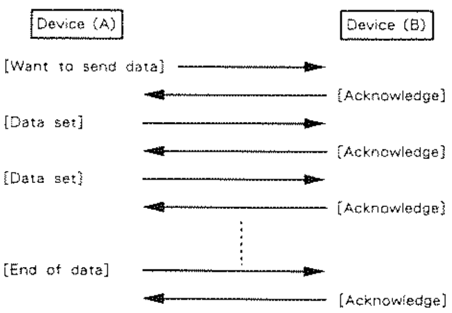
- a WSD or RQD message has specified an illegal data address or size.
- the device is not ready for communication.
- an illegal number of addresses or data has been detected.
- data transfer has been terminated by an operator.
- a communications error has occurred.

An ERR message may be sent out by a device on either side of the interface. Communication must be terminated immediately when either side triggers an ERR message.

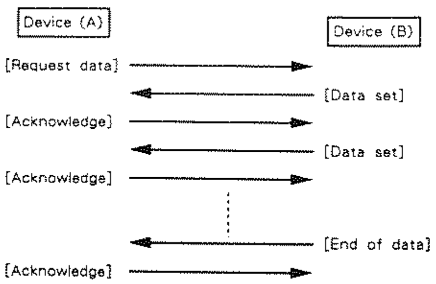
Byte	Description
F0H	Exclusive status
41H	Manufacturer ID (Roland)
DEV	Device ID
MDL	Model ID
4FH	Command ID
F7H	End of exclusive

≈ Example of Message Transactions

● Data transfer from device (A) to device (B).

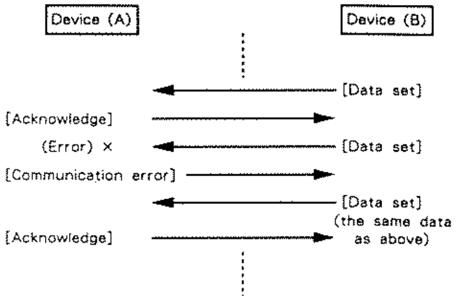


● Device (A) requests and receives data from device (B).

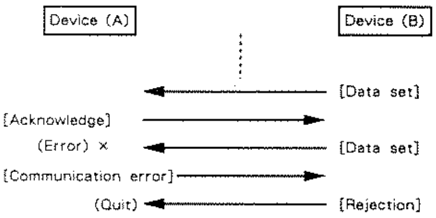


● Error occurs while device (A) is receiving data from device (B).

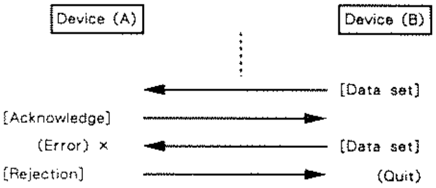
1) Data transfer from device (A) to device (B).



2) Device (B) rejects the data re-transmitted, and quits data transfer.



3) Device (A) immediately quits data transfer.



LA/PCM SOUND MODULE
Model CM－64

MIDI Implementation

Date : Apr. 18. 1989
Version : 1.00

1. TRANSMITTED DATA (LA Sound Part only)

■Exclusive

Status
F0H : System exclusive
F7H : EOX (End Of Exclusive)

For details,see Sections 3 and 4,and Roland Exclusive Messages.

2. RECOGNIZED RECEIVE DATA

■Note event

●Note off

Status	Second	Third
8nH	kkH	vvH
9nH	kkH	00H

kk = note number 00H － 7FH (0 － 127)
vv = velocity ignored
n = MIDI Channel 0H － FH (1 － 16)

A tone whose envelope mode is "NO SUS" ignores Note off message.
(LA Sound Part only)

●Note on

Status	Second	Third
9nH	kkH	vvH

kk = note number 00H － 7FH (0 － 127)
vv = velocity 01H － 7FH (1 － 127)
n = MIDI Channel 0H － FH (1 － 16)

LA SOUND PART (PART 1 － 8) : Note numbers outside of the range 12 － 108 are transposed to the nearest octave inside the range.
LA SOUND PART (RHYTHM PART) : Note numbers outside of the range 24 － 108 are ignored.
PCM SOUND PART :Key range depending on the tone. When note numbers are outside of the key range, they are transposed to the nearest octave inside the range.

■Control change

●Modulation Depth

Status	Second	Third
BnH	01H	vvH

vv = Modulation depth 00H － 7FH (0 － 127)
n = MIDI Channel 0H － FH (1 － 16)

●Data Entry

Status	Second	Third
BnH	06H	vvH

vv = Value of a parameter specified by RPN.(See description in RPN MSB.)
n = MIDI Channel 0H － FH (1 － 16)

●Main Volume

Status	Second	Third
BnH	07H	vvH

vv = Volume Value 00H － 7FH (0 － 127)
n = MIDI Channel 0H － FH (1 － 16)

Controls the volume of a Part accessible through the received MIDI channel.
The maximum volume is determined by Master volume and Expression message.

●Panpot

Status	Second	Third
BnH	0AH	vvH

vv = Panpot Value 00H － 7FH (0 － 127)
n = MIDI Channel 0H － FH (1 － 16)

Orientation of sound is as follows.
127 = LEFT, 64 = CENTER, 0 = RIGHT
This information is ignored in the Rhythm Part.

●Expression

Status	Second	Third
BnH	0BH	vvH

vv = Expression 00H － 7FH (0 － 127)
n = MIDI Channel 0H － FH (1 － 16)

Controls the volume of a Part accessible through the received MIDI channel.
The maximum volume is determined by Master volume and Main Volume message.

●Hold－1

Status	Second	Third
BnH	40H	vvH

vv = 00H － 3FH : off
vv = 40H － 7FH : on
n = MIDI Channel 0H － FH (1 － 16)

●RPN LSB

Status	Second	Third
BnH	64H	vvH

vv = The lower byte of a parameter number controlled by RPN.(Refer to RPN MSB.)
n = MIDI Channel 0H － FH (1 － 16)

●RPN MSB

Status	Second	Third
BnH	65H	vvH

vv = The upper byte of a parameter number controlled by RPN.
n = MIDI Channel 0H － FH (1 － 16)

Using MIDI RPN, CM－64 parameters can be controlled by Control change message. RPN MSB and LSB specify the parameter to be controlled while Data entry sets the parameter value.
Effective RPN to CM－64 is Bender range.

＊LA Sound Part

RPN MSB	RPN LSB	Data Entry	Description
00H	00H	vvH	Bender Range vv = 0 － 24 Unit in semitone, 2 octaves maximum

＊PCM Sound Part

RPN MSB	RPN LSB	Data Entry	Description
00H	00H	vvH	Bender Range vv = 0 － 12 Unit in semitone, 1 octaves maximum

● **Resets All Controllers**

Status	Second	Third
BnH	79H	00H

n = MIDI Channel 0H - FH (1 - 16)

Sets eatch of the following controls as follows.

Controller	setting	
Modulation Depth	MIN	(0)
Expression	MAX	(127)
Hold 1	OFF	(0)
Pitch Bender Change	CENTER	

■ Program change

Status	Second
CnH	ppH

pp = Patch Number 0H - 7FH (1 - 128)
n = MIDI Channel 0H - FH (1 - 16)

Program change information is used to change Patches.
This information is ignored in Rhythm Part.

■ Pitch Bender change

Status	Second	Third
EnH	llH	mmH

ll = Pitch Bender change value (Lower byte) 00H - 7FH (0 - 127)
mm = Pitch Bender change value (Upper byte) 00H - 7FH (0 - 127)
n = MIDI Channel 0H - FH (1 - 16)

■ Mode message

● **All notes off**

Status	Second	Third
BnH	7BH	00H

n = MIDI Channel 0H - FH (1 - 16)

Turns off all notes that have been turned on by MIDI Note on.

● **OMNI OFF**

Status	Second	Third
BnH	7CH	00H

n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 64 remains in mode 3 (omni off, poly).

● **OMNI ON**

Status	Second	Third
BnH	7DH	00H

n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 64 remains in mode 3 (omni off, poly).

● **MONO**

Status	Second	Third
BnH	7EH	mmH

mm = MONO Cahnnel range ignore
n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 64 remains in mode 3 (omni off, poly).

● **POLY**

Status	Second	Third
BnH	7FH	00H

n = MIDI Channel 0H - FH (1 - 16)

Recognized as only All notes off.
CM - 64 remains in mode 3 (omni off, poly).

■ Exclusive

Status	
F0H	: System Exclusive
F7H	: EOX (End Of Exclusive)

Using exclusive message, a set of parameters for a timbre or individual parameters in a patch or timbre can be transferred to CM - 64.
Refer to Roland Exclusive Messages and Sections 3 - 6.

■ Active sensing

Status	
FEH	: Active Sensing

Once recieving this message, the CM - 64 expects to accept status or data in sequence, at last within 300 msec intervals.
If the unit fails to recieve a message 300 msec after previous one, it judges there is a problem somewhere in MIDI path, muting the current sound and setting each of controllers as below, then stopping 300 msec interval monitoring of incoming signal.

Controller	setting	
Modulation Depth	MIN	(0)
Expression	MAX	(127)
Hold 1	OFF	(0)
Pitch Bender Change	CENTER	

3. EXCLUSIVE COMMUNICATION (LA SOUND PART)

Parameters for patches or timbres can be transferred to/from LA SOUND PART through Exclusive message.
Model - ID # of CM - 64 is 16H.
In a system where more than one MIDI channel is assigned to CM - 64, Unit # may be set to the CM - 64 instead of Device - ID # of a basic channel.
The advantage of Unit # is that a specific part is made accessible independent of MIDI channel of that part.
Whether to use MIDI channel or Unit # depends on parameter address.
CM - 64 recognizes MIDI channels 1 thru 16 and Unit # 17 as Device - ID #.
Note that the actual Device - ID # is the number 1 less MIDI channel number or Unit #.

■ One way communication

Request Data 1 RQ1 11H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID (Roland)	
DEV	Device ID	
16H	Model ID	
11H	Command ID (RQ1)	
aaH	Address MSB	* 3 - 1
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	
ssH	Size	
ssH	Size LSB	
sum	Check sum	
F7H	EOX (End Of Exclusive)	

Data set 1　　DT1 12H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID (Roland)	
DEV	Device ID	
16H	Model ID	
12H	Command ID (DT1)	
aaH	Address MSB	* 3 - 1
aaH	Address	
aaH	Address LSB	
ddH	Data	* 3 - 2
:	:	
sum	Check sum	
F7H	EOX (End Of Exclusive)	

● Communication Sequence

CM - 64 never requests data of the other party.
The following sequence applies to the other party that wants to get some parameters from CM - 64.

```
  Receiver                                Transmitter(CM-64)
  ------------                            ------------------


                      [RQ1]---------->

 When a programmer or sequencer         When the received Data request
 needs CM-64 resident parameter.        contains 1) address that
                                        matches a parameter base
                                        address and 2) address size is
                                        1 or more, CM-64 sends the
                                        data in that area.

                      <---------[DT1]

 If the address matches the
 parameter base address, stores
 the data into that location.

 (                    <---------[DT1]                                  )
 (                                      Will repeat sending Data set  )
 (                                      until all requested data are  )
 (                                      receivd by the receiver.      )
```

■ Handshaking communication

Want to send data　　WSD 40H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID (Roland)	
DEV	Device ID	
16H	Model ID	
40H	Command ID (WSD)	
aaH	Address MSB	* 3 - 1
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	
ssH	Size	
ssH	Size LSB	
sum	Check sum	
F7H	EOX (End Of Exclusive)	

Request data　　RQD 41H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID (Roland)	
DEV	Device ID	
16H	Model ID	
41H	Command ID (RQD)	
aaH	Address MSB	* 3 - 1
aaH	Address	
aaH	Address LSB	
ssH	Size MSB	
ssH	Size	
ssH	Size LSB	
sum	Check sum	
F7H	EOX (End Of Exclusive)	

Data set　　DAT 42H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID (Roland)	
DEV	Device ID	
16H	Model ID	
42H	Command ID (DAT)	
aaH	Address MSB	* 3 - 1
aaH	Address	
aaH	Address LSB	
ddH	Data	* 3 - 2
:	:	
sum	Check sum	
F7H	EOX (End Of Exclusive)	

Acknowledge　　ACK 43H

Byte	Description
F0H	Exclusive status
41H	Manufacturer's ID (Roland)
DEV	Device ID
16H	Model ID
43H	Command ID (ACK)
F7H	EOX (End Of Exclusive)

End of data　　EOD 45H

Byte	Description
F0H	Exclusive status
41H	Manufacturer's ID (Roland)
DEV	Device ID
16H	Model ID
45H	Command ID (EOD)
F7H	EOX (End Of Exclusive)

Communication error　　ERR 4EH

Byte	Description
F0H	Exclusive status
41H	Manufacturer's ID (Roland)
DEV	Device ID
16H	Model ID
4EH	Command ID (ERR)
F7H	EOX (End Of Exclusive)

Rejection　　RJC 4FH

Byte	Description
F0H	Exclusive status
41H	Manufacturer's ID (Roland)
DEV	Device ID
16H	Model ID
4FH	Command ID (RJC)
F7H	EOX (End Of Exclusive)

● Communication Sequence

CM – 64 will never require any data of the other party.
The following sequence can apply to the outside world where a unit wants to get CM – 64 resident parameters.

```
Receiver                                   Transmitter(CM-64)
------------                               ------------------

                         [RQD]---------->

Outside unit such as a computer
can obtain CM-64 parameters by
following the steps below, starting
with transmission of Data request.

(                         <---------[RJC]                                 )
(Ends current communication upon          Will send this message when    )
(receipt of this message.                 Data request comes while it    )
(                                         is reproducing sound.          )

                          <---------[DAT]
                                          When the Data request comes
                                          during no-sound period and
                                          contains address listed in the
                                          Parameter bade sddress table
                                          followed by 1 or more address
                                          size, CM-64 will send the data
                                          stored in that address area
                                          and subsequent.

If the address matches the
parameter bade address, stores
the data into that location; then
sends Acknowledge.
                          [ACK]--------->

                                          Sends the next data in reply
                                          to Acknowledge.

                          <---------[DAT]
                          [ACK]--------->
                                 :
(                         [ERR]--------->                                 )
(should failure in data reception         When receiving this message,   )
(occur(e.g. disagreement of checksum),    sends the previous data        )
(sends this message.                      again.                         )
(                         <---------[DAT]                                 )

                                 :
                                 :
                          <---------[EOD]

sends Acknowledge in response to          Sends this data when completing
Data end and terminates handshaking       required data transfer.
communication.

                          [ACK]---------->

                                          When this message comes as an
                                          answer to the Data end,
                                          terminates communication.
```

* 3 – 1 Address and Address size must cover the memory location where data exist.

* 3 – 2 When comming data are for partial reserve of the system parameter, CM – 64 will make these reserves effective only after receiving all the data.

4. EXCLUSIVE COMMUNICATION (PCM SOUND PART)

Parameter for patches can be transferred to CM – 32P throu Exclusive message.
Model – ID = of CM – 32P is 16H.
Device – ID = of CM – 32P is 10H.

■ One way communication

Data set 1 DT1 12H

Byte	Description	
F0H	Exclusive status	
41H	Manufacturer's ID (Roland)	
10H	Device ID	
16H	Model ID	
12H	Command ID (DT1)	
aaH	Address MSB	* 4 – 1
aaH	Address	
aaH	Address LSB	
ddH	Data	* 4 – 2
:	:	
sum	Check sum	
F7H	EOX (End Of Exclusive)	

* 4 – 1 Address and Address size must cover the memory location where data exist.
* 4 – 2 When comming data are for partial reservs of the system parameter,CM – 32P will make these reserves effective only after receiving all the data.

5. PARAMETER ADDRESS MAP (LA SOUND PART)

Addresses are represented in 7 – bit hexadecimal.

Address	MSB		LSB
Binary	0aaa aaaa	0bbb bbbb	0ccc cccc
7-bit Hexadecimal	AA	BB	CC

The actual address of a parameter is a sum of the start address of each block and one or more offset address.

* 5 – 1 Start address plus two offset addresses
(in tables * 5 – 1 and * 5 – 1 – 1 (* 5 – 1 – 2))
* 5 – 2 Start address plus one offset address
(in tables * 5 – 2)
* 5 – 3 Start address plus two offset addresses
(in tables * 5 – 3 and * 5 – 3 – 1)
* 5 – 4 – * 6 – 7 Start address plus one offset address
(in tables * 5 – 4 – * 5 – 7)

■ Parameter base address

Temporary area (Accessed through each basic channel)

Start address	Description	
02 00 00	Timbre Temporary Area (part 1 – 8)	*5-1

Whole part (Accessible on UNIT =)

Start address	Description	
03 00 00	Patch Temporary Area(part 1)	*5-2
03 00 10	Patch Temporary Area(part 2)	
:	:	
03 00 60	Patch Temporary Area(part 7)	
03 00 70	Patch Temporary Area(part 8)	
03 01 00	Patch Temporary Area(rhythm part)	
03 01 10	Rhythm Setup Temporary Area	*5-3
04 00 00	Timbre Temporary Area(part 1)	*5-1
04 01 76	Timbre Temporary Area(part 2)	
:	:	
04 0B 44	Timbre Temporary Area(part 7)	
04 0D 3A	Timbre Temporary Area(part 8)	
05 00 00	Patch Memory #1	*5-4

05 00 08	Patch Memory #2	
:	:	
05 07 70	Patch Memory #127	
05 07 78	Patch Memory #128	
08 00 00	Timbre Memory #1	*5-1
08 02 00	Timbre Memory #2	
:	:	
08 7C 00	Timbre Memory #63	
08 7E 00	Timbre Memory #64	
10 00 00	System area	*5-5
40 00 00	Write Request	*5-6
7F × × ×	All parameters Reset	*5-7

*5-1 Timbre Temporary area / Timbre Memory

Offset address	Description	
00 00 00	Common parameter	*5-1-1
00 00 0E	Partial parameter (for Partial# 1)	*5-1-2
00 00 48	Partial parameter (for Partial# 2)	
00 01 02	Partial parameter (for Partial# 3)	
00 01 3C	Partial parameter (for Partial# 4)	

*5-1-1 Common Parameter

Offset address	Description		
00	0aaa aaaa	TIMBRE NAME 1	32 - 127
:	:	:	(ASCII)
09	0aaa aaaa	TIMBRE NAME 10	
0A	0000 aaaa	Structure of Partial# 1 & 2	0 - 12
			(1 - 13)
0B	0000 aaaa	Structure of Partial# 3 & 4	0 - 12
			(1 - 13)
0C	0000 aaaa	PARTIAL MUTE	0 - 15
			(0000 - 1111)
0D	0000 000a	ENV MODE	0 - 1
			(Normal,No sustain)
Total size	00 00 0E		

*5-1-2 Partial Parameter

Offset address	Description		
00 00	0aaa aaaa	WG PITCH COARSE	0 - 96
			(C1,C#1, - C9)
00 01	0aaa aaaa	WG PITCH FINE	0 - 100
			(-50 - +50)
00 02	0000 aaaa	WG PITCH KEYFOLLOW	0 - 16
			(-1,-1/2,-1/4,0, 1/8,1/4,3/8,1/2, 5/8,3/4,7/8,1, 5/4,3/2,2,s1,s2)
00 03	0000 000a	WG PITCH BENDER SW	0 - 1
			(OFF, ON)
00 04	0000 000a	WG WAVEFORM/PCM BANK	0 - 3
			(SQU/1, SAW/1, SQU/2, SAW/2)
00 05	0aaa aaaa	WG PCM WAVE #	0 - 127
			(1 - 128)
00 06	0aaa aaaa	WG PULSE WIDTH	0 - 100
00 07	0000 aaaa	WG PW VELO SENS	0 - 14
			(-7 - +7)
00 08	0000 aaaa	P-ENV DEPTH	0 - 10
00 09	0aaa aaaa	P-ENV VELO SENS	0 - 100
00 0A	0000 0aaa	P-ENV TIME KEYF	0 - 4
00 0B	0aaa aaaa	P-ENV TIME 1	0 - 100
00 0C	0aaa aaaa	P-ENV TIME 2	0 - 100
00 0D	0aaa aaaa	P-ENV TIME 3	0 - 100
00 0E	0aaa aaaa	P-ENV TIME 4	0 - 100
00 0F	0aaa aaaa	P-ENV LEVEL 0	0 - 100
			(-50 - +50)
00 10	0aaa aaaa	P-ENV LEVEL 1	0 - 100
			(-50 - +50)
00 11	0aaa aaaa	P-ENV LEVEL 2	0 - 100
			(-50 - +50)
00 12	0aaa aaaa	P-ENV SUSTAIN LEVEL	0 - 100
			(-50 - +50)
00 13	0aaa aaaa	END LEVEL	0 - 100
			(-50 - +50)
00 14	0aaa aaaa	P-LFO RATE	0 - 100
00 15	0aaa aaaa	P-LFO DEPTH	0 - 100
00 16	0aaa aaaa	P-LFO MOD SENS	0 - 100
00 17	0aaa aaaa	TVF CUTOFF FREQ	0 - 100
00 18	000a aaaa	TVF RESONANCE	0 - 30
00 19	0000 aaaa	TVF KEYFOLLOW	0 - 14
			(-1,-1/2,-1/4,0, 1/8,1/4,3/8,1/2, 5/8,3/4,7/8,1, 5/4,3/2,2)
00 1A	0aaa aaaa	TVF BIAS POINT/DIR	0 - 127
			(<1A - <7C >1A - >7C)
00 1B	0000 aaaa	TVF BIAS LEVEL	0 - 14
			(-7 - +7)
00 1D	0aaa aaaa	TVF ENV VELO SENS	0 - 100
00 1E	0000 0aaa	TVF ENV DEPTH KEYF	0 - 4
00 1F	0000 0aaa	TVF ENV TIME KEYF	0 - 4
00 20	0aaa aaaa	TVF ENV TIME 1	0 - 100
00 21	0aaa aaaa	TVF ENV TIME 2	0 - 100
00 22	0aaa aaaa	TVF ENV TIME 3	0 - 100
00 23	0aaa aaaa	TVF ENV TIME 4	0 - 100
00 24	0aaa aaaa	TVF ENV TIME 5	0 - 100
00 25	0aaa aaaa	TVF ENV LEVEL 1	0 - 100
00 26	0aaa aaaa	TVF ENV LEVEL 2	0 - 100
00 27	0aaa aaaa	TVF ENV LEVEL 3	0 - 100
00 28	0aaa aaaa	TVF ENV SUSTAIN LEVEL	0 - 100
00 29	0aaa aaaa	TVA LEVEL	0 - 100
00 2A	0aaa aaaa	TVA VELO SENS	0 - 100
			(-50 - +50)
00 2B	0aaa aaaa	TVA BIAS POINT 1	0 - 127
			(<1A - <7C >1A - >7C)
00 2C	0000 aaaa	TVA BIAS LEVEL 1	0 - 12
			(-12 - 0)
00 2D	0aaa aaaa	TVA BIAS POINT 2	0 - 127
			(<1A - <7C >1A - >7C)
00 2E	0000 aaaa	TVA BIAS LEVEL 2	0 - 12
			(-12 - 0)
00 2F	0000 0aaa	TVA ENV TIME KEYF	0 - 4
00 30	0000 0aaa	TVA ENV TIME V_FOLLOW	0 - 4
00 31	0aaa aaaa	TVA ENV TIME 1	0 - 100
00 32	0aaa aaaa	TVA ENV TIME 2	0 - 100
00 33	0aaa aaaa	TVA ENV TIME 3	0 - 100
00 34	0aaa aaaa	TVA ENV TIME 4	0 - 100
00 35	0aaa aaaa	TVA ENV TIME 5	0 - 100
00 36	0aaa aaaa	TVA ENV LEVEL 1	0 - 100
00 37	0aaa aaaa	TVA ENV LEVEL 2	0 - 100
00 38	0aaa aaaa	TVA ENV LEVEL 3	0 - 100
00 39	0aaa aaaa	TVA ENV SUSTAIN LEVEL	0 - 100
Total size	00 00 3A		

Example of RQ1 and DT1 application - - - 1

Obtain Part 2 tone data from the temporary area by sending the following messages.

F0 41 10 16 11 04 01 76 00 01 76 0E F7

*5-2 Patch temporary area

*5-2-1 Patch temporary area (Part 1 - 8)

Offset address		Description	
00 00	0000 00aa	TIMBRE GROUP	0 - 3
			(a, b, i, r)
00 01	00aa aaaa	TIMBRE NUMBER	0 - 63
			(1 - 64)
00 02	00aa aaaa	KEY SHIFT	0 - 48
			(-24 - +24)
00 03	0aaa aaaa	FINE TUNE	0 - 100
			(-50 - +50)
00 04	000a aaaa	BENDER RANGE	0 - 24
00 05	0000 00aa	ASSIGN MODE	0 - 3
			(POLY 1, POLY 2,
			POLY 3, POLY 4)
00 06	0000 000a	REVERB SWITCH	0 - 1
			(OFF, ON)
00 07	0xxx xxxx	dummy (ignored if received)	
00 08	0aaa aaaa	OUTPUT LEVEL	0 - 100
00 09	0000 aaaa	PANPOT	0 - 14
			(R - L)
00 0A	0xxx xxxx	dummy (ignored if received)	
:	:	:	
00 0F	0xxx xxxx	dummy (ignored if received)	
Total size		00 00 10	

*5-2-2 Patch temporary area (Rhythm Part)

Offset address		Description	
00 00	0xxx xxxx	dummy (ignored if received)	
00 01	0xxx xxxx	dummy (ignored if received)	
00 02	0xxx xxxx	dummy (ignored if received)	
00 03	0aaa aaaa	FINE TUNE	0 - 100
			(-50 - +50)
00 04	0xxx xxxx	dummy (ignored if received)	
00 05	0000 00aa	ASSIGN MODE	0 - 3
			(POLY 1, POLY 2,
			POLY 3, POLY 4)
00 06	0xxx xxxx	dummy (ignored if received)	
00 07	0xxx xxxx	dummy (ignored if received)	
00 08	0aaa aaaa	OUTPUT LEVEL	0 - 100
00 09	0xxx xxxx	dummy (ignored if received)	
:	:	:	
00 0F	0xxx xxxx	dummy (ignored if received)	
Total size		00 00 10	

*5-3 Rhythm part setup area

Offset address	Description	
00 00 00	Rhythm Setup (for Key# 24)	*5-3-1
00 00 04	Rhythm Setup (for Key# 25)	
00 00 08	Rhythm Setup (for Key# 26)	
00 00 0C	Rhythm Setup (for Key# 27)	
00 00 10	Rhythm Setup (for Key# 28)	
:	:	
:	:	
:	:	
00 02 4C	Rhythm Setup (for Key# 107)	
00 02 50	Rhythm Setup (for Key# 108)	

*5-3-1 Rhythm setup (for each Key#)

Offset address		Description	
00 00	0aaa aaaa	TIMBRE	0 - 127
			(i01-i64, r01-r64)
00 01	0aaa aaaa	OUTPUT LEVEL	0 - 100
00 02	0000 aaaa	PANPOT	0 - 14
			(R - L)
00 03	0000 000a	REVERB SWITCH	0 - 1
			(OFF, ON)
Total size		00 00 04	

*5-4 Patch memory

Offset address		Description	
00 00	0000 00aa	TIMBRE GROUP	0 - 3
			(a, b, i, r)
00 01	00aa aaaa	TIMBRE NUMBER	0 - 63
00 02	00aa aaaa	KEY SHIFT	0 - 48
			(-24 - +24)
00 03	0aaa aaaa	FINE TUNE	0 - 100
			(-50 - +50)
00 04	000a aaaa	BENDER RANGE	0 - 24
00 05	0000 00aa	ASSIGN MODE	0 - 3
			(POLY 1, POLY 2,
			POLY 3, POLY 4)
00 06	0000 000a	REVERB SWITCH	0 - 1
			(OFF, ON)
00 07	0xxx xxxx	dummy	
Total size		00 00 08	

*5-5 System area

The total munber of Partial reserves for 9 parts must be 32 or less.
All Partial reserves must be sent as a package of 9 parts.

Offset address		Description	
00 00	0aaa aaaa	MASTER TUNE	0 - 127
			(432.1Hz - 457.6Hz)
00 01	0000 00aa	REVERB MODE	0 - 3
			(Room, Hall,
			Plate, Tap delay)
00 02	0000 0aaa	REVERB TIME	0 - 7
			(1 - 8)
00 03	0000 0aaa	REVERB LEVEL	0 - 7
00 04	00aa aaaa	PARTIAL RESERVE (Part 1)	0 - 32
00 05	00aa aaaa	PARTIAL RESERVE (Part 2)	0 - 32
00 06	00aa aaaa	PARTIAL RESERVE (Part 3)	0 - 32
00 07	00aa aaaa	PARTIAL RESERVE (Part 4)	0 - 32
00 08	00aa aaaa	PARTIAL RESERVE (Part 5)	0 - 32
00 09	00aa aaaa	PARTIAL RESERVE (Part 6)	0 - 32
00 0A	00aa aaaa	PARTIAL RESERVE (Part 7)	0 - 32
00 0B	00aa aaaa	PARTIAL RESERVE (Part 8)	0 - 32
00 0C	00aa aaaa	PARTIAL RESERVE (Part R)	0 - 32
00 0D	000a aaaa	MIDI CHANNEL(Part 1)	0 - 16
			(1 - 16, OFF)
00 0E	000a aaaa	MIDI CHANNEL(Part 2)	0 - 16
			(1 - 16, OFF)
00 0F	000a aaaa	MIDI CHANNEL(Part 3)	0 - 16
			(1 - 16, OFF)
00 10	000a aaaa	MIDI CHANNEL(Part 4)	0 - 16
			(1 - 16, OFF)
00 11	000a aaaa	MIDI CHANNEL(Part 5)	0 - 16
			(1 - 16, OFF)
00 12	000a aaaa	MIDI CHANNEL(Part 6)	0 - 16
			(1 - 16, OFF)
00 13	000a aaaa	MIDI CHANNEL(Part 7)	0 - 16
			(1 - 16, OFF)
00 14	000a aaaa	MIDI CHANNEL(Part 8)	0 - 16

Offset address		Description	
			(1 - 16, OFF)
00 15	000a aaaa	MIDI CHANNEL (Part R)	0 - 16
			(1 - 16, OFF)
00 16	0aaa aaaa	MASTER VOLUME	0 - 100
Total size		00 00 17	

Example of RQ1 and DT1 application - - - 2

Set Partial reserve of each part as follows by sending the byte string listed below.

Part 1 ..... 8 Parts 3 thru 8 0

Part 2 ..... 10 Rhythm part 8

F0 41 10 16 12 10 00 04 08 0A 00 00 00 00 00 00 08 52 F7

*5 - 6 Write Request

This message simulates write switch on CM - 64, that is, CM - 64 writes data of each part in the temporary area into internal memory.

(Memory must be specified by two bytes addresses.)

CM - 64 will inform back of the writing result.

No data in this area can be brought outside world by the use of RQ1 and RQD.

Offset address		Description	
00 00	00aa aaaa	Timbre Write (part 1)	0 - 63 (01 - 64)
00 01	0000 0000		0 (Internal)
00 02	00aa aaaa	Timbre Write	
00 03	0000 0000	(part 2)	
:	:	:	
:	:	:	
00 0E	00aa aaaa	Timbre Write	
00 0F	0000 0000	(part 8)	
01 00	0aaa aaaa	Patch Write (part 1)	0 - 127 (1 - 128)
01 01	0000 0000		0 (Internal)
01 02	0aaa aaaa	Patch Write	
01 03	0000 0000	(part 2)	
:	:	:	
:	:	:	
01 0E	0aaa aaaa	Patch Write	
01 0F	0000 0000	(part 8)	
10 00	0000 00aa	Result	0 - 3 0 = Function Completed 1 = Incorrect Mode 2 = Incorrect Mode 3 = Incorrect Mode

Example of RQ1 and DT1 application - - - 3

Direct CM - 64 to write data of Part 3 in the temporary area into #76 by sending the byte string listed below.

F0 41 10 16 12 40 01 04 4B 00 70 F7

*5 - 7 All Parameters Reset

Tone temporary, Patch temporary, System and Patch memory area will be initialized by sending data to this address.

And sets eatch of the following controls as follows.

Controller	setting	
Modulation Depth	MIN	(0)
Expression	MAX	(127)
Hold 1	OFF	(0)
Pitch Bender Change	CENTER	

And turns off all notes that have been turned on.

No data in this area can be brought outside world through MIDI exclusive message such as RQ1 and RQD.

Address Map

Address	Block	Sub Block	Reference
02 00 00	Timbre Temp. (Basic Ch)	Common	5-1-1
		Partial 1	5-1-2
		Partial 2	
		Partial 3	
		Partial 4	
03 00 00	Patch Temp. (Unit#)	Part 1	5-2
		Part 2	
		:	
		Part 8	
		Part R	
03 01 10	Rhythm Setup Temp(Unit#)	Note= 24	5-3-1
		Note= 25	
		:	
		Note= 107	
		Note= 108	
04 00 00	Timbre Temp. (Unit#)	Part 1	5-1
		Part 2	
		:	
		Part 7	
		Part 8	
05 00 00	Patch Memory	# 1	5-4
		# 2	
		:	
		#127	
		#128	
08 00 00	Timbre Memory	# 1	5-1
		# 2	
		:	
		# 63	
		# 64	
10 00 00	System Area		5-5
40 00 00	Write Request		5-6
7F xx xx	All Parameters Reset		5-7

6. PARAMETER ADDRESS MAP (PCM SOUND PART)

Addresses are represented in 7 - bit hexadecimal.

Address	MSB		LSB
Binary	0aaa aaaa	0bbb bbbb	0ccc cccc
7-bit Hexadecimal	AA	BB	CC

■ Parameter base address

Start address	Description	
50 00 00	Patch temporary area(part 1)	*6-1
50 00 15	Patch temporary area(part 2)	
50 00 2A	Patch temporary area(part 3)	
50 00 3F	Patch temporary area(part 4)	
50 00 54	Patch temporary area(part 5)	
50 00 69	Patch temporary area(part 6)	
51 00 00	Patch memory #1	*6-2
51 00 13	Patch memory #2	
:	:	
51 12 5A	Patch memory #127	
51 12 6D	Patch memory #128	
52 00 00	System area	*6-3
7F xx xx	All parameter reset	*6-4

*6 - 1 Patch temporary area

Offset address	Description		
00 00	0000 000a	TONE MEDIA	0 - 1 (Internal, Card)
00 01	0aaa aaaa	TONE NUMBER	0 - 127 (1 - 128)
00 02	000a aaaa	KEY SHIFT	0 - 24 (-12 - +12)
00 03	0aaa aaaa	FINE TUNE	0 - 100 (-50 - +50)
00 04	0000 aaaa	BENDER RANGE	0 - 12
00 05	0aaa aaaa	KEY RANGE LOWER	0 - 127 (C -1 - G 9)
00 06	0aaa aaaa	KEY RANGE UPPER	0 - 127 (C -1 - G 9)
00 07	0000 00aa	ASSIGN MODE	0 - 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 08	0000 000a	REVERB SWITCH	0 - 1 (OFF, ON)
00 09	0000 aaaa	VELOCITY SENS	0 - 15
00 0A	0000 aaaa	ENV ATTACK RATE	0 - 127
00 0B	0000 aaaa	ENV RELEASE RATE	0 - 127
00 0C	0000 aaaa	LFO RATE	0 - 127
00 0D	0000 aaaa	LFO AUTO DELAY TIME	0 - 15
00 0E	0000 aaaa	LFO AUTO RISE TIME	0 - 15
00 0F	0000 aaaa	LFO AUTO DEPTH	0 - 15
00 10	0000 aaaa	LFO MAN RISE TIME	0 - 15
00 11	0000 aaaa	LFO MAN DEPTH	0 - 15
00 12	0000 aaaa	DETUNE DEPTH	0 - 50
00 13	0aaa aaaa	PANPOT	0 - 127 (R - L)
00 14	0aaa aaaa	OUTPUT LEVEL	0 - 100
Total size		00 00 15	

*6 - 2 Patch memory

Offset address	Description		
00 00	0000 000a	TONE MEDIA	0 - 1 (Internal, Card)
00 01	aaaa aaaa	TONE NUMBER	0 - 127 (1 - 128)
00 02	000a aaaa	KEY SHIFT	0 - 24 (-12 - +12)
00 03	0aaa aaaa	FINE TUNE	0 - 100 (-50 - +50)
00 04	0000 aaaa	BENDER RANGE	0 - 12
00 05	0aaa aaaa	KEY RANGE LOWER	0 - 127 (C -1 - G 9)
00 06	0aaa aaaa	KEY RANGE UPPER	0 - 127 (C -1 - G 9)
00 07	0000 00aa	ASSIGN MODE	0 - 3 (POLY 1, POLY 2, POLY 3, POLY 4)
00 08	0000 000a	REVERB SWITCH	0 - 1 (OFF, ON)
00 09	0000 aaaa	VELOCITY SENS	0 - 15
00 0A	0000 aaaa	ENV ATTACK RATE	0 - 127
00 0B	0000 aaaa	ENV RELEASE RATE	0 - 127
00 0C	0000 aaaa	LFO RATE	0 - 127
00 0D	0000 aaaa	LFO AUTO DELAY TIME	0 - 15
00 0E	0000 aaaa	LFO AUTO RISE TIME	0 - 15
00 0F	0000 aaaa	LFO AUTO DEPTH	0 - 15
00 10	0000 aaaa	LFO MAN RISE TIME	0 - 15
00 11	0000 aaaa	LFO MAN DEPTH	0 - 15
00 12	0000 aaaa	DETUNE DEPTH	0 - 50
Total size		00 00 13	

*Internal Tone list

No.	TONE	TYPE	No.	TONE	TYPE
01	A.Piano 1	V-MIX	43	AC.Bass	V-MIX
02	A.Piano 2	V-MIX	44	Choir 1	SINGLE
03	A.Piano 3	V-MIX	45	Choir 2	SINGLE
04	A.Piano 4	V-MIX	46	Choir 3	DUAL
05	A.Piano 5	SINGLE	47	Choir 4	DUAL
06	A.Piano 6	DETUNE	48	Strings 1	SINGLE
07	A.Piano 7	SINGLE	49	Strings 2	SINGLE
08	A.Piano 8	DETUNE	50	Strings 3	DUAL
09	A.Piano 9	SINGLE	51	Strings 4	DUAL
10	A.Piano 10	DETUNE	52	E.Organ 1	SINGLE
11	E.Piano 1	V-MIX	53	E.Organ 2	DETUNE
12	E.Piano 2	SINGLE	54	E.Organ 3	SINGLE
13	E.Piano 3	DETUNE	55	E.Organ 4	DETUNE
14	E.Piano 4	SINGLE	56	E.Organ 5	SINGLE
15	E.Piano 5	DETUNE	57	E.Organ 6	DETUNE
16	A.Guiter 1	SINGLE	58	E.Organ 7	SINGLE
17	A.Guiter 2	DETUNE	59	E.Organ 8	ETUNE
18	A.Guiter 3	DUAL	60	E.Organ 9	DUAL
19	A.Guiter 4	DUAL	61	E.Organ 10	DUAL
20	A.Guiter 5	V-SW	62	E.Organ 11	DUAL
21	E.Guiter 1	V-SW	63	E.Organ 12	DUAL
22	E.Guiter 2	SINGLE	64	E.Organ 13	DUAL
23	E.Guiter 3	SINGLE	65	Soft Tp 1	SINGLE
24	E.Guiter 4	DETUNE	66	Soft Tp 2	DETUNE
25	Slap 1	SINGLE	67	Soft Tp 3	SINGLE
26	Slap 2	DETUNE	68	Tp/Trb 1	SINGLE
27	Slap 3	SINGLE	69	Tp/Trb 2	SINGLE
28	Slap 4	DETUNE	70	Tp/Trb 3	SINGLE
29	Slap 5	V-SW	71	Tp/Trb 4	SINGLE
30	Slap 6	V-SW	72	Tp/Trb 5	DETUNE
31	Slap 7	SINGLE	73	Tp/Trb 6	DUAL
32	Slap 8	DETUNE	74	Sax 1	SINGLE
33	Slap 9	SINGLE	75	Sax 2	SINGLE
34	Slap 10	DETUNE	76	Sax 3	SINGLE
35	Slap 11	V-SW	77	Sax 4	DETUNE
36	Slap 12	V-SW	78	Sax 5	DUAL
37	Fingered 1	SINGLE	79	Brass 1	SINGLE
38	Fingered 2	DETUNE	80	Brass 2	SINGLE
39	Picked 1	SINGLE	81	Brass 3	DUAL
40	Picked 2	DETUNE	82	Brass 4	DUAL
41	Fretless 1	SINGLE	83	Brass 5	DUAL
42	Fretless 2	DETUNE	84	Orch Hit	SINGLE

*6 - 3 System area

The total number of Partial reserves for 6 parts must be 31 or less. All Partial reserves must be sent as a package of 6 parts.

Offset address		Description	
00 00	0aaa aaaa	MASTER TUNE	0 - 127 (432.1Hz - 457.6Hz)
00 01	0000 00aa	REVERB MODE	0 - 3 (ROOM, HALL Plate, Tap delay)
00 02	0000 0aaa	REVERB TIME	0 - 7 (1 - 8)
00 03		REVERB LEVEL	0 - 7
00 04	00aa aaaa	PARTIAL RESERVE (PART 1)	0 - 31
00 05	00aa aaaa	PARTIAL RESERVE (PART 2)	0 - 31
00 06	00aa aaaa	PARTIAL RESERVE (PART 3)	0 - 31
00 07	00aa aaaa	PARTIAL RESERVE (PART 4)	0 - 31
00 08	00aa aaaa	PARTIAL RESERVE (PART 5)	0 - 31
00 09	00aa aaaa	PARTIAL RESERVE (PART 6)	0 - 31
00 0A	000a aaaa	MIDI CHANNEL (PART 1)	0 - 16 (1 - 16 ,OFF)
00 0B	000a aaaa	MIDI CHANNEL (PART 2)	0 - 16 (1 - 16 ,OFF)
00 0C	000a aaaa	MIDI CHANNEL (PART 3)	0 - 16 (1 - 16 ,OFF)
00 0D	000a aaaa	MIDI CHANNEL (PART 4)	0 - 16 (1 - 16 ,OFF)
00 0E	000a aaaa	MIDI CHANNEL (PART 5)	0 - 16 (1 - 16 ,OFF)
00 0F	000a aaaa	MIDI CHANNEL (PART 6)	0 - 16 (1 - 16 ,OFF)
00 10	0aaa aaaa	MASTER VOLUME	0 - 100
Total size	00 00 11		

*6 - 4 All Parameter Reset

Tone temporary, Patch temporary, System and Patch memory area will be initialized by sending data to this address.

And sets eatch of the following controls as follows.

Controller	setting	
Modulation Depth	MIN	(0)
Expression	MAX	(127)
Hold 1	OFF	(0)
Pitch Bender Change	CENTER	

And turns off all notes that have been turned on.

Address Map

Address	Block	Sub Block	Reference
50 00 00	Patch Temp.	Part 1	6-1
		Part 2	
		:	
		Part 5	
		Part 6	
51 00 00	Patch Memory	# 1	6-2
		# 2	
		:	
		#127	
		#128	
52 00 00	System Area		6-3
7F xx xx	All Parameters Reset		6-4

LA／PCM SOUND MODULE [LA Sound Part] Date : Apr. 18. 1989

Model CM－64

MIDI Implementation Chart

Version : 1.00

Function ···		Transmitted	Recognized	Remarks
Basic Channel	Default	×	2－10	
	Changed	×	×	
Mode	Default	×	3	
	Messages	×	×	
	Alterd	*********	×	
Note Number		×	0－127	
	True Voice	*********	12－108	
Velocity	Note ON	×	○ v＝1－127	
	Note OFF	×	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	○	
Control Change	1	×	○	Modulation
	2－5	×	×	
	6	×	*	Data Entry
	7	×	○	Volume
	8, 9	×	×	
	10	×	○	Pan
	11	×	○	Expression
	12－63	×	×	
	64	×	○	Hold 1
	65－99	×	×	
	100, 101	×	* (0)	RPN LSB, MSB
	102－120	×	×	
	121	×	○	Reset All Controllers
Prog Change		×	○ 0－127	
	True #	*********	0－127	
System Exclusive		○	○	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Messages	Local ON／OFF	×	×	
	All Notes OFF	×	○ (123－127)	
	Active Sense	×	○	
	Reset	×	×	
Notes		* RPN＝Registered Parameter Number RPN # 0 : Pitch Bend Sensitivity The value of parameter is to be determined by entering data.		

Mode 1 : OMNI ON, POLY　　Mode 2 : OMNI ON, MONO　　○ : Yes

Mode 3 : OMNI OFF, POLY　　Mode 4 : OMNI OFF, MONO　　× : No

LA/PCM SOUND MODULE [PCM Sound Part] Date : Apr. 18. 1989

Model CM-64

MIDI Implementation Chart

Version : 1.00

Function ···		Transmitted	Recognized	Remarks
Basic Channel	Default	×	11 – 16	
	Changed	×	×	
Mode	Default	×	3	
	Messages	×	×	
	Alterd	*********	×	
Note Number		×	0 – 127	
	True Voice	*********	*1	
Velocity	Note ON	×	○ v = 1 – 127	
	Note OFF	×	×	
After Touch	Key's	×	×	
	Ch's	×	×	
Pitch Bender		×	○	
Control Change	1	×	○	Modulation
	2 – 5	×	×	
	6	×	*2	Data Entry
	7	×	○	Volume
	8, 9	×	×	
	10	×	○	Pan
	11	×	○	Expression
	12 – 63	×	×	
	64	×	○	Hold 1
	65 – 99	×	×	
	100, 101	×	*2 (0)	RPN LSB, MSB
	102 – 120	×	×	
	121	×	○	Reset All Controllers
Prog Change		×	○ 0 – 127	
	True #	*********	0 – 127	
System Exclusive		×	○	
System Common	Song Pos	×	×	
	Song Sel	×	×	
	Tune	×	×	
System Real Time	Clock	×	×	
	Commands	×	×	
Aux Messages	Local ON/OFF	×	×	
	All Notes OFF	×	○ (123 – 127)	
	Active Sense	×	○	
	Reset	×	×	

Notes

*1 Varies depending on the tone.
*2 RPN = Registered Parameter Number
RPN # 0 : Pitch Bend Sensitivity
The value of parameter is to be determined by entering data.

Mode 1 : OMNI ON, POLY Mode 2 : OMNI ON, MONO
Mode 3 : OMNI OFF, POLY Mode 4 : OMNI OFF, MONO

○ : Yes
× : No

Specifications

CM-64 LA／PCM Sound Module

Sound Modules :
LA Synthesis system (maximum number of voices : 32)
PCM system (maximum number of voices : 31)

Part :
LA Sound Module Section : Part 1 - 8, Rhythm Part
PCM Sound Module Section : Part 1 - 6

Power supply :
9V DC (Supplied by ACB Series AC adaptor)

Current consumption :
1200mA (at 9V DC)

Dimensions :
284 (W)× 239 (D)× 46 (H)mm
11-3／16" × 9-1／4" × 1-2／3"

Weight :
2kg／4 lb 6 oz

Accessories :
AC adaptor
MIDI cable (1 pc.)
Connection cord (2 pcs.)
Owner's Manual
Guidebook for MIDI

Options :
PCM Card (SN-U110 Series)

* The specifications for this product are subject to change without prior notice, in the interest of improvement.

Information

- Please use this AC adaptor only with the specified device.
- Please use the AC Adaptor of an appropriate voltage (120, 220 or 240) depending on the voltage system in your country.
- When the device is not used for a long period, be sure to disconnect the AC adaptor (Power Supply Unit) from the wall outlet.
- When you need repair service, call your local Roland Service Station as shown below or the authorized Roland distributer in your country.

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